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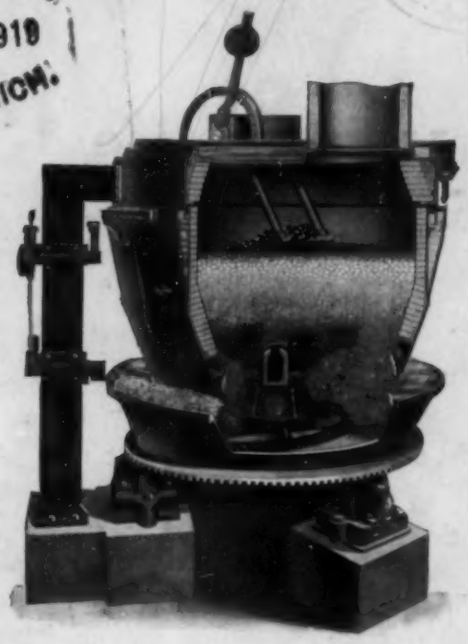

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Difference in first cost comes back annually, every detail built for endurance.

Four hundred of these splendid machines ordered in the first four years.

They have been selected by every large purchaser in the steel industry this year.

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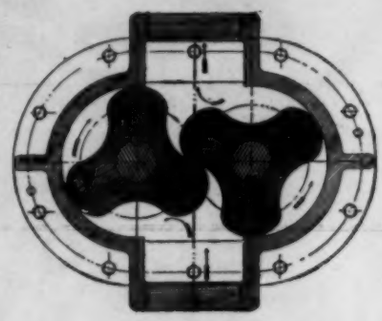

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Are extremely simple, rugged and efficient.

The above illustrates internal construction showing the two symmetrical rotating parts which are called impellers.

These do not come in contact with the case or with each other but are separated by a small clearance.

The pump discharges six times per revolution resulting in a smooth flow with the minimum of shock.

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High Lift Pump | Circulating Pump | Vacuum Heating Pump | Lubricating Oil Pump | Paper Mill Pump | Pump and Condenser

THE IRON TRADE REVIEW

Vol. LXV Cleveland, October 30, 1919 *No. 18*

Coal Strike Overhangs Market

Steel Producers Shut off Quotations and Sales Awaiting Week's Developments—Rail Sales Closed for Next Year at Unchanged Price — Early Material of all Classes Exceedingly Scarce—Output Steadily Gains

COAL strike possibilities are being anticipated by the iron and steel industry and constitute the ruling factor in the market for the present. Various producers of finished steel who have been accepting new business right along for forward delivery abruptly have terminated this practice and will make no further quotations until the situation clears. Some of them have recalled outstanding quotations. The result is that prices in many lines have become purely nominal and much business is suspended. Should the strike be averted and selling resumed, it is not believed likely that any permanent general price advances in finished steel will take place because the larger interests still are pursuing a policy of restraint against higher quotations.

The stronger market on semifinished steel and such raw materials as pig iron and certain grades of scrap which is based on increased operating costs and general scarcity, however, continues to hold prices at an advanced level. The sheet situation has become exceedingly tight and in the Youngstown district the limited tonnage available is moving at an advance of several dollars a ton. Eastern plate and shape makers no longer will equalize the Pittsburgh freight for western delivery.

More Plants Running

Interference by the Ohio state authorities in the steel strike situation at Canton, is helping along the restoration of operations at that point. This action likewise promises to work benefits to other Ohio districts where the inability or unwillingness of local officials to afford proper protection to the workmen materially has retarded the resumption of plants. General production of iron and steel is forging ahead steadily and reduced efficiency is being overcome by degrees. The shortage of common labor is a source of considerable difficulty. The Carnegie Steel Co. is producing at the rate of 70 per cent of total ingot capacity and the entire Pittsburgh district is 80 per cent or more active. The largest sheet maker is operating 85 per cent full and independent sheet mills at 80 per cent of the rate of production before the strike. At Gary and Indiana Harbor operations are at 75 per cent.

Iron Still on Rise

Pig iron sales for next year on a higher level generally established a week or so ago, have been heavy. A shortage of early iron is growing constantly more acute and this is resulting in various premiums being paid. The restricted supply of open top cars because of the coal crisis is seriously hampering shipments in some districts. A large central western interest with furnaces in the valley and along the lakes has booked 100,000 tons of foundry and malleable iron for first half delivery during the past few weeks at a $2 advance and now has withdrawn. Chicago makers have made a second advance in as many weeks and are naming $30 furnace for the base grade, representing a total rise of $3.25. Eastern irons generally are moving higher. A 10,000-ton sale of malleable for first half has been made at Buffalo at 29.50 furnace. Basic iron is backward but there is an nonconfirmed report at Pittsburgh of a sale of 20,000 tons for next year on a higher basis.

Some Rails are Sold

A widely-circulated report that standard open-hearth rails have been advanced $2 to $49 mill has been due to a misappresension of a quotation at Chicago made on a round tonnage for western roads. The price remains $47 and sales at this figure have been made by an independent mill for next year's delivery. It is believed that these are the first orders to be taken direct from the railroads in anticipation of their return to private control. Similar rail negotiations at Chicago involve at least 100,000 tons.

Foreign purchasers of iron and steel are showing a tendency to hold back because of immediate uncertainties affecting deliveries. An inquiry for 10,000 coal cars for Belgium requiring 65,000 tons of steel in addition to the axles is before American builders. An inquiry for 50,000 tons of relaying rails for Chile is reported. A 30,000-ton sale of shipbuilding material to Japan is credited to the Steel corporation.

OCTOBER 30, 1919

THE IRON TRADE REVIEW

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Labor Obeys "That Impulse"

WITHDRAWAL from the national industrial conference by representatives of organized labor was typical of the position they have taken on all great issues involving the peace of industry which have been presented in recent years. It confirms the opinion held by many impartial observers that no progress can be made toward an equitable settlement of industrial problems until organized labor's leaders are made to respect obligations.

In the case of the industrial board those leaders were willing enough to proceed in accordance with rules agreed on by the board; they were willing to accept all the advantages that might result from the conference, but when they lost a point they promptly withdrew, and charged that the game was not played fair. It is another instance in which the representatives of trade unions have demonstrated that they will either dictate or destroy.

The withdrawal of the delegates under the circumstances that obtained, and in opposition to President Wilson's expressed desire that further thought be given to a program for industrial harmony, must have convinced the employers' and public groups that negotiations of this character are futile unless there be a clear understanding that labor, like the other parties to the conference, be pledged to abide by its decisions.

Collective bargaining was agreed to by the representatives of the employers, and it was agreed that the employes might select representatives of their own choosing, but the employers would not bind themselves to deal with representatives selected from outside of the shop personnel. Such an agreement would in effect bind them to a recognition of trade unions and the closed shop. The labor group tried to make it appear that the closed shop was not the issue; that their resolution providing for collective bargaining was an innocent measure, establishing a principle they declared to be universally recognized, but when the "joker" was revealed, and when it was shown how the resolution was susceptible of interpretation the labor group promptly withdrew.

The violation of labor's obligations to continue until the various issues were discussed and decided upon, then to accept or reject them as a whole if it did not consider itself bound to abide by the decisions of the conference, was so bald as to suggest that other reasons were at the foundation. At about the same time the Gompers resolution for collective bargaining was voted down his resolution for arbitration of the steel strike and for the principle of the open shop also was defeated, by action of the public group. The matter of collective bargaining might have been brought up at a later date and an agreement obtained satisfactory to all parties; the breach was not sufficiently wide to warrant labor walking out. But with final action taken on the steel strike, Gompers and his confreres realized that they had lost the strike and decided there was no more use for the conference.

Conferences such as that at Washington might serve a very useful purpose in extricating labor chieftains from a difficult situation, but where there is "no chance" of warping it to such a purpose, organized labor promptly obeys "that impulse."

Sounding the Slogan of Americanism

FEW men are given the opportunity to receive so wholehearted and unanimous an ovation from their associates or business competitors as was accorded Judge Gary at the semiannual meeting of the American Iron and Steel institute at New York last week. Both at the opening session of the day and at the banquet in the evening, the appearance of Judge Gary or some pertinent declaration on his part on several occasions was made the signal for an outburst of great and prolonged applause. This positive demonstration of approval of his position before the country on broad questions affecting the welfare of industry and brought to the front by the arbitrary demands of radical labor leaders, was

formally expressed by the assembled manufacturers in a resolution of unqualified indorsement. In that resolution the iron and steel industry of the country gave its fullest approval to the principle of the open shop and to that of collective bargaining such as shall not be restricted to a mere instrument for the promotion of unionism. There never has been any question as to where the iron and steel industry has stood upon these questions, but its straightforward enunciation of its position is important just now.

While the iron and steel industry in indorsing the course of the one who had acted as its spokesman was applauding a principle as Judge Gary himself modestly declared, the great tribute to the man and his leadership also was equally clear. Likewise apart from its peculiar trade significance, this action was a sincere appreciation of an exponent of true Americanism by a representative body of responsible citizens. The country at large and the steel industry especially is fortunate in these troubled times in possessing the quality of courage and of leadership of such a man as Judge Gary. Emphasis was laid upon this fact by the clear analysis of the domineering attitude of labor unionism, the sane and well-balanced opinion on incipient bolshevism in this country, and the stern remedy for all skulking enemies of law and order which he expressed in all his addresses.

The meeting of the American Iron and Steel institute was characterized by various unusual features and events which added, in an important way, to the history of that organization. It was honored by the presence of the king of Belgium and by other foreign dignitaries and leaders. In many respects it was probably the most remarkable meeting of its kind ever held by the institute. But the real service which it performed for the country under prevailing conditions was the clear, strong note of militant Americanism which it sounded against radicalism in all its vicious forms affecting both the peaceful relations of industry and the established institutions of the nation.

Peace Vital to Copper Market

ATTENTION frequently is called by copper producers to the effect on the copper market of the delay in the ratification of the peace treaty. They assert that inability to make satisfactory credit arrangements is delaying large purchases. Financial arrangements await until peace is promulgated.

At the international trade conference in Atlantic City last week it was said France would need 90,000 to 100,000 tons of copper in 1920, and Italy 15,000 tons, while Belgium will need large quantities of copper sheets. In addition, Germany and the smaller countries of Europe will need much copper. Germany alone imported an average of over 100,000 tons yearly for 10 years before the war. With exchange at present levels, the cost of American copper to the Germans now amounts to more than $1 a pound, as against 22 cents in New York.

Balanced against this potential demand, the copper producers have a large stock of refined copper, variously estimated at 500,000 tons or more. They are apparently carrying this metal for future demand, and are content to make sales against current production. Present copper prices, while considered moderate in comparison with market values of other commodities, seem based on the balance of current domestic consumption plus small export sales, against current output, and without regard to the large stock.

Non-Destructive Tests for Steel

DURING the past few years an increased amount of attention has been given to the subject of testing steel by methods which do not destroy the test pieces. Considerable progress has been made in utilizing magnetic methods in the study of the internal structure and mechanical condition of iron and steel, and a great amount of research work has been conducted to apply X-rays to the study of steel.

Well written papers, in which the present status of magnetic analysis and X-ray examination of steel is clearly outlined, were presented at the general meeting of the American Iron and Steel institute held in New York last week. It was shown that the work already done has furnished sufficient evidence that the magnetic and mechanical properties of steel strictly correspond. It seems that this warrants the conclusion that magnetic methods may be used to advantage in fundamental investigations and for nondestructive testing of steel products. The future development of magnetic testing probably will involve much study in an effort to properly interpret the results of analyses.

The study of steel by means of X-rays has not been perfected to the extent already attained in magnetic analysis. The rays, thus far, can only detect small inclusions and flaws, providing they are in the immediate neighborhood of the photographic plate and near the surface of the piece. Large imperfections near the center of large pieces must be detected by other means.

However, there is a wide field in modern industry for both methods and, as ably pointed out by Professor Howe, the X-ray may be considered as supplementary to magnetic analysis. The products of a mill can be tested magnetically, quickly and at little cost. The X-ray test, because it is slow and more expensive, should be used only on parts shown by other tests to be suspicious. In the case of steel to be used on products on which life depends, both tests should be used and every precaution taken to detect flaws.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 1224 AND 1226

Pig Iron

Bessemer, valley	**$27.95**
Bessemer, Pittsburgh	**29.35**
Basic, valley	27.15
Basic, Pittsburgh	25.75
Basic, delivered, eastern Pa.	28.00
Basic, Buffalo, furnace	**26.75**
Malleable, Pittsburgh	29.90 to 30.40
Malleable, Chicago, furnace	29.25
Malleable, Buffalo, furnace	27.25 to 29.50
Malleable, delivered eastern Pa.	33.10 to 33.60

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern delivered Phila.	$34.10 to 35.60
No. 1 foundry, Chicago furnace	30.00
No. 2 foundry, valley, Pittsburgh	30.40
No. 2 foundry, Buffalo	29.00 to 31.00
No. 2 Northern, Boston	33.90 to 34.90
No. 2 foundry, Cleveland furnace	29.00 to 30.00
No. 2 foundry, Ironton furnace	29.00 to 29.75
No. 2 foundry, Chicago furnace	28.75
No. 2X, eastern del., Phila.	33.10 to 34.10
No. 2X, eastern, N. J. tidewater	33.10 to 34.10
No. 2X, eastern, Boston	34.90 to 36.90
No. 2X foundry, Buffalo furnace	30.00 to 32.00
No. 2 foundry, del., Philadelphia	32.10 to 33.10
No. 2 foundry, N. J. tidewater	32 10 to 33.10
No. 2 southern, Birmingham	**28.00 to 29.00**
No. 2 southern, Cincinnati	31.00 to 32.00
No. 2 southern, Chicago	33.00 to 34.00
No. 2 southern, Phila.	34.50 to 35.50
No. 2 southern, Cleveland	33.00 to 34.00
No. 2 southern, Boston	36.00 to 37.00
No. 2 southern, St. Louis	32.25 to 33.25
Virginia, No. 2X, furnace	31.25 to 32.00
Virginia, No. 2X, Philadelphia	35.35 to 36.10
Virginia, No. 2X, Jersey City	35.65 to 36.40
Virginia, No. 2X, Boston	35.95 to 36.70
Gray forge, valley, Pittsburgh	28.40
Gray forge, Buffalo	26.25 to 28.00
Gray forge, eastern Pa.	29.00 to 30.00
Silveries, 8%, furnace	43.00 to 43.25
Ohio Silveries, 8%, Chicago	46.80
Tennessee Silveries, 8%, Chicago	48.65
Low phos. standard, Phila.	40.50 to 41.00
Low phos. Lebanon, furnace	35.00
Low phos. standard, Pittsburgh	39.00 to 40.00
Charcoal, Superior, Chicago	34.75
Charcoal, Superior, Chicago first quarter 1920	35.25

Coke

(At the ovens)

Connellsville furnace	$5.00 to 5.50
Connellsville foundry	6.00 to 7.00
Pocahontas furnace, nominal	5.75 to 6.00
Pocahontas foundry, nominal	6.50 to 7.00
New River foundry, nominal	8.50 to 9.50
New River furnace, nominal	7.50
Wise county furnace, nominal	6.00 to 6.50
Wise county foundry, nominal	7.50 to 8.00

Ferroalloys

Ferromanganese, 80 per cent, delivered producers' price	**$110.00**
Ferromanganese, 80 per cent, English c.i.f. Atlantic ports	100.00 to 105.00
Spiegel, 18 to 22 per cent furnace, spot	33.00 to 35.00
Ferrosilicon, 50 per cent, spot and contract, delivered	80.00 to 85.00
Ferrotungsten, standard, per pound contained, furnace	1.20 to 1.30
Ferrochrome, 60 to 70 per cent chromium, 4 to 6 per cent carbon, per pound contained, maker's plant	22 to 24 cents
Ferrovanadium, 35 to 40 per cent per pound contained, according to analysis	$5.50 to $7.00
Ferro carbon-titanium, carloads, producers plant, per net ton	200.00
Bessemer, ferrosilicon, 10 per cent	49.75
Bessemer, ferrosilicon, 11 per cent	53.05
Bessemer, ferrosilicon, 12 per cent	56.35

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O.

Semifinished Material

BILLETS AND BLOOMS

(4 x 4 inch)

Open-hearth, Pittsburgh	$38.50 to 40.50
Open-hearth, Philadelphia	47.50
Open-hearth, Youngstown	38.50 to 40.50
Bessemer, Pittsburgh	38.50 to 40.50
Bessemer, Youngstown	38.50 to 40.50
Forging, Pittsburgh	51.00 to 53.00
Forging, Philadelphia	60.00

SHEET BARS

Open-hearth, Pittsburgh	$42.00 to 45.00
Open-hearth, Youngstown	42.00 to 45.00
Bessemer, Pittsburgh	42.00 to 45.00
Bessemer, Youngstown	42.00 to 45.00

SLABS

Pittsburgh and Youngstown	41.00 to 43.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$52.00
Grooved skelp, Pittsburgh	2.45c
Sheared skelp, Pittsburgh	2.65c

Shapes, Plates and Bars

(In cents per pound)

Structural shapes, Pittsburgh	2.45c
Structural shapes, Philadelphia	2.695c
Structural shapes, New York	2.72c
Structural shapes, Chicago	2.72c
Tank plates, Pittsburgh	2.65c
Tank plates, Chicago	2.92c
Tank plates, Philadelphia	2.895c
Tank plates, New York	2.92c
Bars, soft steel, Pittsburgh	2.35c
Bars, soft steel, Chicago	2.62c
Bars, soft steel, New York	2.62c
Bars, soft steel, Philadelphia	2.595c
Bar iron, common, Phila.	2.745c
Bar iron, common, Chicago	2.72c
Bar iron, common, Cleveland	2.52c
Bar iron, common, New York	2.77c
Bar iron, common, Pittsburgh	2.75c
Hard steel bars, Chicago	2.55c to 2.65c

Rails, Track Material

Standard bessemer rails, mill	$45.00
Standard open-hearth rails, mill	47.00
Relaying rails, light, St. Louis	40.00 to 46.00
Relaying rails, Pittsburgh	39.00 to 41.00
Angle bars, Pittsburgh base	2.75c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mill	$2.10 to 2.45
Spikes, railroad, Pittsburgh	3.35c
Track bolts, Pittsburgh	4.50c
Track bolts, Chicago	4.62c
Track spikes, Chicago	3.62c
Tie plates, Chicago	2.75c to 2.90c

Wire Products

(100 lbs. to jobbers, carloads; retailers 5c more)

Wire nails, Pittsburgh	3.25c to 3.50c
Plain wire, Pittsburgh	3.00c to 3.10c
Galvanized wire, Pittsburgh	3.70c to 3.80c
Barbed wire, painted, Pitts.	3.40c to 3.50c
Barbed wire, galvanized, Pitts.	4.10c to 4.20c
Cut nails, Pittsburgh l. c. l.	5.045c
Coated nails per count keg, Pitts.	2.85c to 3.10c

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Polished staples, Pittsburgh	3.40c to 3.50c
Galvanized staples, Pittsburgh	4.10c to 4.20c

Chain, Piling, Strip Steel

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	5.75c
Sheet piling, base, Pittsburgh	2.55c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 5.65c.

Sheets

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.35c
No. 28, bessemer, Pitts.	4.35c
No. 28, open-hearth, Chi.	4.62c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.35c
No. 28, bessemer, Pitts.	4.35c

GALVANIZED

No. 28, open-hearth, Pitts.	5.70c
No. 28, bessemer, Pitts.	5.70c
No. 28, open-hearth, Chi.	5.97c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.55c
No. 10, bessemer, Pitts.	3.55c
No. 10, open-hearth, Chi.	3.82c
No 10, open-hearth, Phila.	3.795c

Full sheet schedule page 1224.

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.00

Iron and Steel Pipe

Base Pittsburgh to Jobbers Carloads

Base, Pittsburgh	Black Per cent off	Galv. Per cent off
⅜ to 3 in., butt, steel	57½	44
⅜ to 3 in., butt, iron	39½	23½

Full pipe schedule page 1224.

Boiler Tubes

Steel, 3½ to 4½ inches, l. c. l.	40½
Iron, 3½ to 4½ inches, c. l.	10

Cast Iron Water Pipe

Without War Freight Tax

(Class B Pipe)

Class A pipe is $2 higher than Class B.

Four-inch, Chicago	$62.80
Six-inch and over, Chicago	59.80
Four-inch, New York	61.30
Six-inch and over, New York	58.30
Four-inch, Birmingham	56.00
Six-inch and over, Birmingham	53.00

Hoops, Bands, Shafting

Hoops, Pittsburgh	3.05c
Bands, Pittsburgh	3.05c
Hot rolled strip steel, Pitts. stamping quality	3.30c
Cold finished steel bars, Pitts., base	3.00c

Cotton ties, lots of 1000 to 3000 bundles, $1.78½ per bundle, mill.

Cotton ties, 3000 bundles and over, $1.76½ per bundle.

Rivets

Structural rivets, Pittsburgh	3.00c
Boiler rivets, Pittsburgh	4.00c
Rivets ⅞ in. and smaller Pitts.	60–5 off

Nuts and Bolts

(Prices f. o. b. Pittsburgh)

CARRIAGE BOLTS

(⅝ x 6 inches, smaller and shorter)

Rolled thread	50–10 off
Cut thread	50 off
Larger and longer	40–5 off

MACHINE BOLTS

(⅝ x 4 inches, hot pressed nuts)

Rolled thread	60 off
Cut thread	50–10 off
Larger and longer	45–5 off
Cold pressed semifinished hexagon nuts ⅝ in. and larger	70 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	75–5 off
Gimlet and cone point lag screws	60 off

NUTS

Hot pressed, square blank	2.70c to 3.10c off
Hot pressed, square tapped	2.45c to 2.85c off
Hot pressed, hexagon blank	2.70c to 3.10c off
Hot pressed, hexagon tapped	2.45c to 2.85c off
Cold pressed, square tapped	2.45c to 2.85c off
Cold pressed, square blank	2.70c to 3.10c off
Cold pressed, hexagon blank	2.70c to 3.10c off
Cold pressed, hexagon tapped	2.45c to 2.85c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Prices are those ruling on the largest percentage of sales at the dates named.

	Prices Oct. 29, 1919	Average prices Sept. 1919	July 1919	Oct. 1918
Bessemer, valley, del., Pittsburgh	$29.35	$29.35	$29.35	$36.60
Basic, valley, delivered, Pittsburgh	27.15	27.15	27.15	34.40
*No. 2 Foundry, Pittsburgh	30.40	28.15	28.15	35.40
*No. 2 Foundry, Chicago, furnace	30.00	26.75	26.75	34.00
Lake Superior charcoal, Chicago	34.75	32.75	31.75	38.70
Malleable, valley	29.00	28.65	28.65	35.90
Malleable, Chicago	30.50	27.25	27.25	34.50
*Southern, No. 2, Birmingham	29.00	26.75	25.00	35.25
*Southern Ohio, No. 2, Ironton	29.75	26.75	26.75	34.00
Basic, eastern del., eastern Pa.	28.00	27.00	26.50	36.60
**No. 2X, Virginia, furnace	31.25	29.25	26.50	37.50
*No. 2X, eastern del., Philadelphia	33.60	29.95	29.50	38.85
Gray forge, valley del., Pittsburgh	28.40	27.15	27.15	34.40
Ferromanganese, 80 per cent. delivered	110.00	105.00	112.00	250.00†
Bessemer billets, Pittsburgh	40.50	38.50	37.30	47.50
Bessemer sheet bars, Pittsburgh	45.00	42.00	40.80	51.00
Open-hearth sheet bars Pittsburgh	45.00	42.00	40.80	51.00
Open-hearth billets, Pittsburgh	40.50	38.50	37.30	47.50
Steel bars, Pittsburgh	2.35	2.35	2.35	2.90
Steel bars, Chicago	2.62	2.62	2.62	3.17
Iron bars, Philadelphia	2.745	2.595	2.595	3.73

	Prices Oct. 29, 1919	Average prices Sept. 1919	July 1919	Oct. 1918
Iron bars, Cleveland	$2.52	$2.52	$2.52	$3.64
Iron bars, Chicago mill	2.72	2.62	2.62	3.50
Beams, Chicago	2.72	2.72	2.72	3.27
Beams, Pittsburgh	2.45	2.45	2.45	3.00
Beams, Philadelphia	2.695	2.695	2.695	3.23
Tank plates, Pittsburgh	2.65c	2.55	2.65	3.25
Tank plates, Chicago	2.92	2.92	2.92	3.52
Tank plates, Philadelphia	2.895	2.845	2.895	3.48
Sheets, blk., No. 28, Pittsburgh	4.35	4.35	4.31	5.00
Sheets, blue anld., No. 10, Pittsburgh	3.55	3.55	3.51	4.25
Sheets, galv., No. 28, Pittsburgh	5.70	5.70	5.66	6.25
Wire nails, Pittsburgh	3.25	3.25	3.25	3.50
Connellsville furnace coke	5.00	4.65	4.00	6.00
Connellsville foundry coke	6.50	5.90	4.90	7.00
Heavy melting steel, Pittsburgh	20.00	20.50	19.90	29.00
Heavy melting steel, eastern Pa.	20.25	19.00	18.85	28.50
Heavy melting steel, Chicago	19.50	19.10	19.40	29.00
No. 1 wrought, eastern Pennsylvania	27.00	27.00	24.70	34.00
No. 1 wrought, Chicago	22.50	21.25	21.20	33.50
Rerolling rails, Chicago	29.50	25.50	24.70	34.00

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon. †70 per cent.

Pig Iron Shortage Grows Acute

Melters Cast About in all Directions for Early Metal—Restricted Car Supply Complicating Factor—Liberal Sales for Next Year Made at Advanced Levels—Cleveland Interest Sells 100,000 Tons—Chicago Prices Again Raised

Chicago, Oct. 28.—After having been moved from $26.75 to $28.75, furnace, for foundry iron containing 1.75 to 2.25 silicon, the Chicago market has advanced a second time to $30, furnace, for that grade and to $30.50, furnace, for malleable. These figures applies only on first half, as northern furnaces are unable to take on further orders for the remainder of this year. The new bid is $3.25 higher than that which prevailed through most of the present year. Local makers find they have comparatively small tonnage remaining for first half and with production cut off to a great extent during the past five weeks and the future uncertain, it is difficult to estimate closely how much iron will be available for the first half. As a result only regular customers are being considered for that delivery. Stocks on furnace yards promise to be practically cleaned up within a short time as demand has made it possible to deliver off iron and misfit lots which ordinarily would not be considered. Demand for iron is heavy. One local seller has disposed of considerable iron from the valleys, the first sales having been at $26.75, furnace, but $28.75, furnace now is being obtained. Iron is also being shipped into this district from Birmingham, southern Ohio and the Soo. The latter and Birmingham iron are being delivered here on a practical equality as to price. One recent sale covered 3000 tons of foundry from a valley producer to two Chicago consumers. An important southern producer recently sold 4000 tons of foundry to a Chicago melter. Malleable is unusually scarce, and while foundries using this grade have not met with difficulty as yet, stocks are falling and unless larger delivery is made, some of them may find it necessary to curtail operation. A Wisconsin consumer is inquiring for 3500 tons of malleable for first half, and another melter 2000 tons of malleable for the same delivery. It is rumored currently in this market that a recent sale of malleable from southern Ohio covered 3000 tons at $31.25, furnace, a $4 over the Redfield schedule. A sale of between 5000 and 10,000 tons of foundry is said to have been made at $30, furnace, for 1.75 to 2.25 silicon. With the strike of furnace men at Jackson, O., still in force, the situation as to silveries continues strong. Recent sales of 500 tons and 1000 tons of Ohio silveries have been made at $45.25, furnace, for eight per cent. A Tennessee maker is quoting $45.25, furnace, for eight per cent for first half, and is out of the market for this year. The latter has a freight advantage of 40 cents over the Ohio district. Lake Superior charcoal iron for first half has been advanced to $33 and $34.25, furnace, for the base grade.

Demand for Foundry Iron is Strong

Boston, Oct. 27.—The demand for spot foundry iron which was strong a week ago, has increased, and prices may be said to be secondary in many transactions. Inquiries exceed the available supply and there is a tendency on the part of foundries to become scared over the possibility of running out of iron. Odd lots are being grabbed as fast as offered even though the manganese and silicon content is not what is desired. Greater activity has also been reported in 1920 business. The weak spot in 1920 delivery has disappeared and while sales continue to be made at as much as $2 under spot delivery prices, this is because of the excessive prices in spot rather than a softening in future. A Buffalo furnace sold 1000 tons of 2X eastern (2.25 to 2.75 silicon) to a Massachusetts machinery manufacturer at $32 at the furnace for first half delivery. An eastern Pennsylvania furnace sold 500 tons of 2X eastern for first half delivery at $33 at the furnace. Sales for immediate delivery have been reported as high as $35 at eastern Pennsylvania furnaces for high silicon iron. The General Electric Co. wants approximately 3000 tons for its two Massachusetts plants. More furnaces are reported as sold for this year and some are going out of blast for repairs. Among these latter is Crane Iron Works which is out for alterations and improvements. The amount of iron sold during the week through Boston dealers has not been large, partly because of the scarcity of iron. The estimated total is 7000 tons about evenly divided between 1920 and 1919 business.

Sales Dwindle, Prices Advance

New York, Oct. 27.—It is becoming more difficult to obtain pig iron in this district, since practically all eastern furnaces are sold up for the remainder of the year. The amount of business during the past week was not nearly as large as in recent weeks. While pig iron is scarce, no instances have been reported in this territory where foundries have been forced to curtail operations due to lack of metal. As a matter of fact, it has been possible to get enough to meet requirements, although in a good many cases it was necessary to go to some trouble to do so. To obtain prompt iron, consumers have had to pay increasing prices. Thus, several sales of 2.25 to 2.75 silicon foundry for prompt

shipment have been made during the past week at $33, western Pennsylvania furnace, and the same grade has been sold at $33.25, Buffalo. A fair tonnage of Buffalo foundry, containing 2.75 to 3.25 silicon, has been sold during the past week at $35, Buffalo. Most makers continue out of the market on deliveries for next year. Some central Pennsylvania foundry for first quarter has been sold at $33, furnace, for 2.25 to 2.75 silicon. One of the few exceptions to the generally sold-up condition is in the case of Virginia iron, but even in that district there is very little iron to be had. One furnace, which recently was selling 2.25 to 2.75 silicon at $30, furnace, has advanced its price to $32, furnace, and has sold some tonnage. This interest also has sold some 1.75 to 2.25 silicon at $31, furnace. It is understood that some 2.25 to 2.75 silicon iron for this year has been sold at $33 and $34, Virginia furnace, but this is not verified. Fancy prices are being done on such Virginia high-silicon still available. One eastern Pennsylvania maker, in reply to an inquiry for first quarter, has asked $35, furnace, on 2.25 to 2.75 silicon, and $34, on 1.75 to 2.25 silicon. Considerable charcoal iron has been sold in this district for first half but offers have been withdrawn. Export business is developing slowly. One lot of 1000 tons of foundry was closed by a Japanese buyer after several postponements, and the buyer had to pay $1.25 per ton higher than he originally was asked.

Foundry Grades Jump in Price

Pittsburgh, Oct. 28.—Insistent demand and a shortage in the supply are finding reflection in a constantly upward tendency in prices of foundry and malleable grades of pig iron. In the past week 1000 tons of No. 2 grade was taken by a Pittsburgh district consumer at $29, valley furnace, while 500 tons of the same grade went to a Johnstown, Pa., radiator company, at the same price from another valley furnace, both sales were for delivery this year. Practically every merchant producer serving this district on foundry iron is sold out for this year and it is extremely doubtful if a price of less than $30, furnace, would be accepted on sizable tonnages for shipment up to Jan. 1. That, at any rate, now is the asking price of the interest who has not withdrawn from the market, and single cars continue to move at substantial premiums over that figure. One furnace interest, which had accumulated some inquiiries for first half recently opened its books and sold a round tonnage of valley iron on the basis of $28.75, furnace, for 1.75 to 2.25 silicon, and $30, furnace, for 2.25 to 2.75 silicon. This company then withdrew from the market. Generally, there is marked aversion to taking on 1920 business until a clearer line is to be had on cost but most interests are willing to accept reservations from regular customers on first half requirements and to make contracts providing for the naming of the price at a later date. Sales aggregating approximately 7000 tons of malleable are reported by a valley merchant interest at from $27.25 to $28.75. The bulk of these purchases was to Michigan and other Middle Western points for delivery this year.

Sell More Iron at Increased Price

Buffalo, Oct. 28.—More sales have been made by the Buffalo iron interest which last week quoted current delivery iron at the new price levels of $31 to $34 for foundry grades. Good tonnages have been sold at these figures. Another interest which has not been affected by the strike retired from the market for 1919 iron during the past week after selling several thousand tons. This interest obtained $31 for iron of 2.75 to 3.25 per cent silicon; $30 for 2.25 to 2.75 silicon, and $29 for 1.75 to 2.25 silicon.

A prominent consumer in this territory has closed for 10,000 tons of malleable for first half at $29.50 Buffalo, representing an advance of $2.25 over the former price.

Foundry Sales Are Heavy

Cleveland, Oct. 28.—The scarcity of pig iron is growing steadily and sellers are having much difficulty to find the metal to meet the new demands for early delivery. This situation is being complicated by the continued ban placed by the railroad administration on the use of open-top cars, exclusive of certain types, except for the coal traffic. Consequently the furnaces are having more trouble to load iron and are resorting to the use of some box cars. Some little valley iron is available for this year at $30 furnace, for 1.75 to 2.25 silicon and southern Ohio iron for early shipment continues to be sold in this territory at $29.75 furnace, or $32.15 delivered, for the same grade. Heavy sales of first half iron, particularly foundry, have been made by prominent producers on the basis of $28.75 furnace, for 1.75 to 2.25, and $30 furnace, for 2.25 to 2.75 silicon, and a round tonnage of this has been from valley furnaces. The total sales by one leading producer comprising principally first half iron and closed largely during the past two weeks are about 100,000 tons. This interest now has withdrawn from the market. Many of these sales have represented inquiries which have been accumulating for some weeks pending the opening of furnace books for delivery after Jan. 1. Some makers still are holding back on accepting orders for that period and one of them reports an aggregate inquiry for that delivery now on hand of 32,000 tons, the bulk of it foundry grades and in lots from 100 to 2500 tons. First half inquiry generally for foundry iron is active. No transactions in basic are reported but some of the valley steelmakers who are under contract have been endeavoring to increase these tonnages. Only two blast furnaces continue active in Cleveland, which is the same as a week ago.

Shortage Becoming Acute

Philadelphia, Oct. 28.—The scarcity of pig iron has reached such an acute stage that some consumers will have to shutdown soon for lack of metal. It constantly is becoming more difficult to locate iron and although the furnaces in some cases are diverting iron from plants which have adequate stocks, they are unable entirely to relieve the situation in this way. Fancy prices are being paid in some cases for such iron as is to be had and this particularly is true of high silicon. No. 2X (2.25 to 2.75 silicon) for prompt shipment has been sold during the past few days at $33 eastern Pennsylvania, $34 Buffalo, $33 central Pennsylvania, $32 Virginia and $31 Pittsburgh. Buyers are reaching out in all directions for iron and attempts now are being made to locate tonnage in the district west for eastern users. No. 1X (2.75 to 3.25 silicon) has sold at $35 eastern Pennsylvania and $37 Buffalo. Some of the prices noted are exceptional and the regular market for this year still may be quoted at $32 to $33 eastern Pennsylvania furnace for No. 2X. All usual eastern sources now are sold up for this year, excepting Virginia and comparatively little Virginia iron is left. A Virginia company which was selling some high silicon and manganese iron has withdrawn from the market. Another Virginia maker who recently has been restricting sales to No. 2X now is oversold on this grade and is selling some No. 2 plain (1.75 to 2.25 silicon) for delivery in 30 to 60 days at $31 furnace. Another Virginia maker has a price of $30 furnace on No. 2 plain with regular differentials but has no No. 2 plain and very little No. 2X. It is selling mainly No. 1X and higher silicon. There is a little more interest in selling iron for first half. One eastern Pennsylvania furnace sold some first half No. 2X at $32 furnace. Another is asking $35 furnace for No. 2X for first half. The most interesting development, however, is the fact that a valley furnace is soliciting business here at $30.75 valley for No. 2 plain with regular differential for first half. Its freight rate here is $4.40. Several eastern consumers urgently want malleable but cannot get this grade. About 1500 tons of basic has been bought by a leading eastern consumer at around $28 delivered. Eastern users have bought 2000 tons of copper-bearing low phosphorus at $35 furnace and several hundred of standard iron have been sold at $37 eastern furnace.

Offer More Iron for 1920

Cincinnati, Oct. 27.—Both northern and southern furnaces are now more willing to take business for next year, although only one maker in the South has opened his books. This producer is taking business on a basis of $29, for 1.75 to 2.25 silicon, Birmingham, for first quarter shipment. A southern Ohio interest has been booking orders for either the first quarter or first half at $29, Ironton, and another large producer in the same district has set $29.75 as his minimum for that delivery. Malleable is very firm, but no new sales are reported as consumers have about filled their requirements for the next few months.

Demand for Basic Increases

St. Louis, Oct. 25.—Demand for all grades of pig iron is urgent and a large tonnage, made up of relatively small lots, has been sold. The largest lot for immediate delivery reported during the week was 1200 tons. Consumers, especially the iron foundries, have all the business they can handle, and in a number of cases new orders have been turned down

because of lack of capacity and inability to secure raw materials. Selling agencies report excellent inquiries, mainly for prompt shipment, though they have had numerous inquiries for iron for the first quarter. Selling into 1920 has been on an unusually small scale.

The National Enameling & Stamping Co. is reported to have purchased 25,000 tons of basic at Chicago for first quarter at $25.75, furnace. In addition this corporation recently has taken 6000 to 8000 tons for this year, the reported price being $25.75, southern Ohio furnace.

Southern Iron Selling Into 1920

Birmingham, Ala., Oct. 28.—Pig iron sales are being made by southern producers for 1920 delivery on a basis of $29 for No. 2 foundry (1.75 to 2.25 silicon), $30.15 for No. 1 foundry (2.25 to 2.75 silicon) and $31.40 for 2.75 to 3.25 silicon. Some of the furnace companies are out of the market, either on spot or 1920 iron, for the reason that the probable make for this year practically has been sold. Numerous orders are being received for 1920 delivery, and negotiations are under way for a large tonnage.

Ore Movement

Slowing Up—Season's Shipments to Approximate 48,000,000 Tons

Cleveland, Oct. 29.—The ore movement has slowed up perceptibly due principally to the inability of furnaces to take shipments, and in some instances to a shortage of cars. There is no market for ore at present, although one of the leading operators could place 60,000 more tons if it had the dock facilities for handling the ore until it could obtain cars for shipment to the furnace interest seeking the tonnage.

Little hope is now entertained for renewed activity in shipping before the close of the navigation season. Reports received by ore operators indicate that ore storage yards at furnaces are well filled up. This accounts in a measure for the fact that while more furnaces are going into blast they are unable to accept more ore at present. Some furnaces have the labor to unload the ore, but will have no place to put it until consumption has reduced stockpiles. One ore company reports that the interests which it serves have so far resumed production that they are able to take shipments up to the full extent of available cars.

Total shipments from the Lake Superior district for this season will be 20 per cent less than shipments in 1918. Shipments for the first 23 days of October, 1919, amounted to 4,765,000, and on a basis of current shipments the month's total will approximate 6,000,000 tons. It is estimated that the balance of the season's shipments will bring the total up to 48,000,000, approximately 13,000,000 tons less than the combined shipments of last year.

Vessel tonnage to move 1,000,000 tons of ore in 1920 from the Lake Superior district to Lake Erie ports already has been contracted for.

Strike Call Sends Up Coke

Prospect of Walkout of Coal Miners Makes Market Erratic—General Asking Price is $5.50—Foundry Coke Also Advances

Pittsburgh, Oct. 28.—Illustrative of the condition of the market for furnace coke, sales in the past few days have ranged from $4.75 to $6, ovens. The higher price represents purchases made by eastern interests, who, alarmed by the possibility of a tie-up of the soft coal mines, next Saturday, have made price a secondary consideration. That price also has been paid for about 4000 tons for export. On the other hand, a sale of 25 cars of standard furnace coke was made about four days ago at $4.75 and this week $5.25, ovens, appears to be as high as any of the furnaces have been obliged to pay on direct busness. The market today is quotable on direct sales from $5 to $5.25, with the general asking price of the oven operators, $5.50, ovens. The possiblity that the strike of the coal miners will not occur on Saturday has been strengthened by the President's message to the coal miners' union officials and inquiries this week have tapered down considerably. The situation, however, remains extremely uncertain and even though the strike order may be rescinded, it is possible there may be some dislocation of production due to the fact that miners in some parts of the country will go out Saturday. Although output of the beehive ovens recently showed a substantial gain, shipments against contracts absorb the increase and it is stated that the regions are bare of surplus supplies. It is reported that a round tonnage is on the market at $6 and the word from Connellsville today was that the car supply on the Monongahela division for tomorrow would be only 20 per cent as compared with 100 per cent during the past few weeks. Foundry coke also has been bringing better prices recently than it commanded a week or 10 days ago. Numerous small sales for immediate shipment are reported at $7, ovens, and $6.50, ovens, appears to be the minimum on brands of high reputation. The production of coke from the Connellsville region for the week ended Oct. 18, is estimated by *The Connellsville Courier* to have been 204,445, as compared with 153,764 tons in the previous week.

New England Placing Large Orders

Boston, Oct. 27.—As a result of the threatened coal strike foundries are placing heavy orders for coke. The Providence by-product producer which reported some weeks ago that it was sold up for this year now states that its product for first quarter also has been taken. Many of the large consumers have placed good orders during the week. A textile machinery manufacturer has purchased nearly all of its first-half requirements. Another concern has ordered a car a day in addition to the amount covered by its regular contract. All of the dealers report heavier spot orders taken than have been placed in many weeks. The price remains the same at $10.90 for this year and $11.90 for next, although it is expected that spot delivery prices will be raised the first of the month.

Spot Demand Pushes Up Price

New York, Oct. 27.—Due to the threat of the coal miners to strike Nov. 1, there has been a large demand for coke from consumers in this district. The spot demand has served to push up prices about 50 cents a ton. Standard beehive foundry coke for spot shipment now is held at $6.25 to $7, Connellsville. Demand for by-product foundry coke also is good, but prices are unchanged in this district. The northern New Jersey by-product maker continues to ask $6, Connellsville, or $9.10, delivered at Newark and other New Jersey points for this year, and $6.50, Connellsville, for next year. Some export business is being done.

Prices Advanced in All Districts

Cincinnati, Oct. 27.—Coke prices have advanced sharply in all districts. It is reported that some spot foundry coke in the Connellsville field recently brought $9, ovens, but the contract figures range from $6.50 to $7. Most coke producers are unwilling to take on much future business, and practically all contracts are so worded to protect producers in case coal should be advanced. Wise county oven operators have practically withdrawn from the market, except for such fuel as they can offer for November-December shipment. The same condition exists in the New River field, where practically no furnace or foundry coke is to be obtained.

Prices Advanced at St. Louis

St. Louis, Oct. 25.—An advance of about 50 cents on all grades of coke was recorded in the market here during the week. This restores the quotations obtaining here immediately prior to the steel strike. Banking of furnaces in the strike areas released a quantity of coke, which was placed at small concessions in this district, but now the furnaces are again operating. Connellsville 72-hour foundry is bringing from $6 to $6.75, ovens, for reasonably prompt shipment, and subject to car supply. The demand is described as active to urgent, and all industries are eagerly taking everything arriving. Many are seeking to stock up. Inquiries range from 300 to 1500 tons, and several orders have been refused because of inability to secure the desired tonnages at the ovens. The West and Southwest, which for a time were out of this market, are now figuring prominently in inquiries. This is explained by the fact that the South, which offers an attractive freight differential to many western and southwestern points is unable to furnish coke in the quantities desired. There has been some contracting into 1920, but less than usual.

Scrap Prices Moving Up

Foundry Grades Make the Best Showing—Some Steel Sold Higher in East—More Life Generally Shown

FOR COMPLETE SCRAP PRICES SEE PAGE 1226

Chicago, Oct. 28.—Considerably greater activity is present in the scrap iron and steel market at Chicago, and prices are moving upward most decidedly. Resumption by steel mills is good and affords an outlet for heavy melting steel and allied grades, while demand for bar iron is causing activity in rolling mill material. Cast scrap and other material which can be used in the cupola are decidedly active and prices are above the local quotation for pig iron. However, this figure is less than that asked for pig iron coming from outside sources and represents a medium course. The Chicago, Burlington & Quincy offers 4400 tons of scrap included in which is 600 tons of steel rails, the Chicago, Indianapolis & Louisville 700 tons of No. 1 steel rail and 40 tons of No. 2 steel rail, and the Chicago, Milwaukee & St. Paul 700 tons of assorted scrap.

Machinery Scrap Sells Readily

Boston, Oct. 27.—New England foundries continue to buy No. 1 machinery scrap almost as fast as it is offered, in fact it is often difficult to obtain this grade in as large lots as demanded. The price remains firm at $28 with occasional sales at $28.50 delivered to consumer. Inquiries in Boston from foundries at a considerable distance from Boston scrap yards, have been reported in unusual numbers. These have come from Vermont, Maine, and Connecticut and in the majority of cases have resulted in orders. Scrap dealers however point out that their principal business is in heavy melting and other grades used by steel makers and that in these lines the market is decidedly quiet. New England during the past month has been the source of great quantities of war department scrap and offerings are being made from the local ordnance office almost daily. Recent proposals cover 135 tons of round steel bars, smaller quantities of steel projectiles, steel edgings for helmets, and of complete 75-millimeter steel shells, also about 140 tons of malleable cast heads for trench mortar shells. The New England Bolt Co. was awarded 135 tons of bessemer screw stock at $1.61 per 100 pounds f.o.b. Orange, Mass.

Foundry Grades Are in Demand

Pittsburgh, Oct. 28.—Although the possibility of a coal strike Nov. 1 makes for conservatism in the matter of new purchases of scrap by the steel manufacturers, it is noted that practically all of them are issuing permits for the shipment of material due them on contracts. A Pittsburgh steel company, whose plant has been idle since early in the year for rebuilding, recently bought a round tonnage of heavy melting steel, for which it paid $21, delivered. This sale and the shipments on permits constitutes all of the recent business in steel plant scrap. Foundry scrap, however, has been in strong demand presumably because of the recent inability of the foundries to secure full shipments of pig iron against contracts and the lack of spot supplies of the latter except at substantial advances. No. 1 cupola cast has found a ready sale at $25 to $26, delivered, and on small tonnages even more has been obtained. It is doubtful if any of this grade could be bought today under $26, as dealers have been combing the country for supplies and have offered as much as $25. Railroad malleable also is in strong demand, and sells readily at full quotations. The Pennsylvania railroad, lines east, is offering 26,200 gross tons of scrap in its November list, the largest items of which are 3500 gross tons of No. 1 steel rails, 2200 gross tons of miscellaneous rails, 2000 gross tons of No. 1 heavy melting steel, 1800 gross tons of No. 2 railroad wrought, 1500 gross tons of destroyed steel cars, 1200 gross tons of couplers and knuckles and 1000 gross tons of No. 2 uncut structural and bridge steel.

Prices Advanced in New York

New York, Oct. 27.—Demand for borings and turnings and heavy melting steel continues. Eastern Pennsylvania consumers are covering on sizeable tonnages, and prices are tending upward. No change, however, has been made in heavy melting steel, quoted at $15.50 to $16, f.o.b. New York. Prices of clean cast borings have advanced to $14 and $14.50, and machine shop turnings to $11.50 and $12. On all other descriptions quotations are unchanged.

Eastern Market Shows Strength

Philadelphia, Oct. 28.—The scrap market in this district shows great strength. There has been some business in heavy melting steel at higher prices, and there would be more if it were not for the fact that dealers will not accept prices offered. There has been considerable buying of machine-shop turnings by blast furnaces, rolling mills and steel works, and also considerable buying of borings by rolling mills and steel works. Forge and bundled sheets are in demand for the charcoal iron industry. Demand for cast scrap is good.

Shipments Now Going Forward

Buffalo, Oct. 28.—Dealers are looking for a brisk market in scrap when steel mills operate on a normal basis. There is more life to the market today than there has been at any time since the strike began. Scrap is scarce, due perhaps to the fact that dealers may be holding back tonnages expecting higher prices, now that pig iron is on the rise. Shipments that were held up when the strike started are now going forward to mills outside the district. Heavy melting steel, turnings, borings, malleable and cast are in demand. There are no changes in prices.

Hold Scrap for Higher Prices

Cleveland, Oct. 29.—While signs of a better market for scrap iron and steel are unmistakable, the average dealer in this market is not optimistic. Mills in the valley are increasing operations, while cast and malleable continue in good demand in the Cleveland district proper. However, one of the largest consumers of turnings and melting steel is out of the market for the remainder of the year. Practically no cars are available for scrap. One dealer offers $20 for melting steel, and has been unable to get it. A bid of $11.60 for turnings proved too low. A Cleveland dealer, bidding on scrap produced by a Detroit interest, offered $11.10 for borings, $9.60 for turnings, $15.10 for short flashings and $15 for hydraulic compressed, and was too low on every item. The freight rate on scrap from Detroit is $2.40. Yards are holding their scrap, and are refusing offers slightly above published quotations.

Cars Lacking; Movement is Slow

Cincinnati, Oct. 27.—Urgent demand for gondola cars for coal has made it impossible for dealers to obtain the cars for scrap. Embargoes against Pittsburgh also are still in effect, and little scrap of any kind is moving. Local foundries are buying small quantities for delivery by truck. Dealers are buying scrap sparingly, and purchases made out of the city are to be held by the sellers until cars can be secured. The Portsmouth plant of the Whittaker-Glessner Co., is again in operation and the Andrews Steel Co., and Newport Rolling Mill Co., expect to start their plants Nov. 3. These will afford an outlet for considerable mill scrap. All prices are nominal, as transactions are too few on which to base definite values.

Rerolling Grades in Demand

St. Louis, Oct. 25. Orders and inquiries for scrap have been confined mostly to car lots or small tonnages for immediate use, although a few round tonnages are reported to have changed hands. The principal element of strength in the market is the limited supply. Virtually nothing is coming into this market. No railroad lists were out during the week, and the movement from the country is almost at a standstill. Among dealers and yard interests the opinion is general that when the steel strike is settled there will be a boom period. In this district, rolling mills are deluged with orders, and rerollers are in particularly strong demand, with few offered and the price advancing daily. Quotations have advanced to from $28 to $28.50. The leading local interest using rerolling rails is not in the market, but there are strong inquiries from Moline, Monroe, Chicago and Ohio. Relaying rails are also in demand, the inquiry coming principally from the

oil fields of the Southwest. Iron foundries continue busy and all grades suitable are firm. Steel mill grades are showing more activity.

More Activity in South

Birmingham, Ala., Oct. 28.—There is a little more activity in the southern scrap market, and if the threatened coal strike does not disturb the iron and steel industry considerable business will be noted before long. Heavy melting steel is not moving fast, as the dealers are holding for higher prices than consumers offer. Cast and stove plate are doing well, while the low grades, machine-shop turnings and cast-iron borings, also are in demand. Quotations have changed a little. Wrought, axles, rails and wheels are not much in demand. A little country scrap is coming in.

No Selling

In Wire Products Except Fence Wire —Export Demand Heavy

Pittsburgh, Oct. 28.—All makers of wire and wire products are out of the market as far as new business is concerned, except for fence wire, on which line they are accepting specifications from regular customers. The company here which recently had a moderate amount of barbed wire and galvanized wire in the heavier gages available for prompt shipment has become sold up and has withdrawn. Producers whose plants were suspended or crippled by the strike and which since have resumed, report steady gains both in operations and in production. Export demands for wire products, especially nails, continue heavy but are placed with extreme difficulty owing to the lack of surplus tonnage over the contract obligations of producers. The lower quotations on wire products now find basis only on shipments against orders placed some time ago.

Better Production Seen

Chicago, Oct. 28.—Conditions in the wire market have undergone no essential change during the past fortnight, but a gradual increase in production has taken place with consequent slightly increased shipments. This has not been sufficient however, to take the edge off the desire of consumers to receive more wire and nails. With production much curtailed and a large order book, selling is at a minimum.

Warehouse Prices to Go Up

New York, Oct. 27.—Although quotations in the local warehouse market remain unchanged, an advance in some descriptions is likely in the near future. The difficult position of the mills continues to be reflected by a good demand for practically all materials, and sheets appear especially strong. The strike situation has improved considerably, but so heavily are the majority of mills booked, that nearby deliveries are difficult to obtain, and consequently consumers are relying on warehouses. This is particularly true in regard to structurals.

Sheet Prices Are Higher

Limited Tonnage of Valley Material Available Moving at Several Dollars Advance—Supplies Scarce—Operations Steadily Improve

Youngstown, O., Oct. 28.—Sheet production at Mahoning valley mills continues low. Only two plants are running and at one of these operation is on a small scale. Makers are doing their best to look after their regular customers but conditions are beyond their control. It is not a question of price since a large tonnage of black sheets could have been sold at 4.75c last week by one maker, but one of demand due to the shortage of various grades.

Spot business is at a standstill. Any surplus, which in the past might have been piled on mill floors, has disappeared and it is questioned whether an appreciable amount of sheets remain in stock at any mill in this district. Any buyer will find it extremely difficult to get on the books for any reasonable amount for this or next months' delivery. He stands a fair chance, if well known, however, of getting a shipping date in December. Stocks perhaps never were as low nor rolling schedules so congested at valley mills as they are now. Buyers requiring No. 27 gage or lighter find it impossible to place orders, since mill books are occupied with more attractive rollings. The present demand, 14 to 20 gage, would be ample to keep the mills rolling for several weeks.

When mill books are thrown open again it is thought higher prices will prevail. At present all grades are commanding from $4 to $6 per ton more than last week's quotations, not only in the Mahoning valley but in nearby territories. The reason for this sudden increase is attributed to raw material conditions. Steelmakers are obliged to pay higher prices for scrap. Consumers of sheet bars are paying $45 and they show no surprise at the mention of $50 bars by 1920. With spelter around 7.60c galvanized makers state they cannot afford to make coated sheets at 5.70c. Any tonnages that can be had here now, are quoted as follows: Blue annealed, 3.65c to 3.75c; black, 4.40c to 4.60c; galvanized, 5.80c to 6.00c; and mill warmers, $22 to $25 per ton.

Operations Still Are Gaining

Pittsburgh, Oct. 28.—The American Sheet & Tin Plate Co., this week is operating more than 85 per cent of its sheet mills, while independents are running close to 60 per cent of their capacity. Approximately 80 per cent of the latter's mills which were in operation on the day of the steel strike are now operating. Some of the independent companies are none too well off in the matter of supplies of sheet bars but none of them has been obliged to suspend because of inability to secure semifinished steel. Production is larger at practically all plants, but deliveries are somewhat hampered at a number of them because of the shortage of common labor. Numerous demands are coming out for practically all kinds of sheets from consumers whose regular sources of supply are unable to make full shipments. Such inquiries get practically no attention as current production is 100 per cent pledged on contracts. The American Sheet & Tin Plate Co., has not yet opened its books for first quarter and first half of 1920 business, and the independent companies are waiting for that interest to take the first step in this direction.

Eastern Demand is Good

Philadelphia, Oct. 28.—Demand for sheets is good, but as many mills are idle few can take orders. The leading eastern maker continues shut down because of labor trouble. One consumer has bought two cars of galvanized sheets from a mill now active at $6.20, Pittsburgh base, which is premium of 50 cents per 100 pounds.

Small Supplies

Of Semifinished Steel Bring Higher Prices—Sheet Bars Scarce

Pittsburgh, Oct. 28.—Demands for sheet bars still are large and urgent, but actual sales are small due to the fact that leading producers in this district have no surplus beyond their own requirements and their contract obligations. One of the Pittsburgh steel companies which took about 4500 tons of sheet bars this week now has no surplus steel to market in this or any other form. Several of the makers of sheets and tin plate are in need of sheet bars owing to the fact that their regular sources of supply are crippled, if not entirely shut off. No trouble would be experienced, it is declared, in obtaining substantial premiums over the March 21 base of $42 from these buyers. Fair demand is noted for billets which are not so scarce as sheet bars, and while sales are reported as high as $40.50, business at premiums is not large. Open market demands for slabs are few and moderate, but makers of wire rods who have surplus tonnage have little trouble in disposing of it. Sale of 300 tons of soft wire rods are noted to a domestic consumer at $60.

Strip Production Rises

Pittsburgh, Oct. 28.—Some of the makers of strip steel in the district which was adversely affected by the walk-out of Sept. 22 gradually are increasing operations. General production is larger now than it has been since the strike started. The heaviest bookings come from the builders of automobiles and tractors and they are pressing for deliveries of material on these agreements.

The Cleveland-Akron Bag Co., Cleveland, will build a $1,000,000 factory at St. Joseph, Mo.

Can't Meet Bar Demands

Production Falls Behind Contract Obligations and Little New Selling is Done—Specifications Filed Promptly—Bar Iron Strong

Chicago, Oct. 28.—Inquiry for soft steel bars is on the increase as to number of inquirers, but most lots are small and practically everything is for prompt delivery. Mills cannot promise delivery, and can only agree to roll the material within a certain period after the labor situation has allowed a return to normal conditions. At the same time mill operation is such that a fair tonnage is being produced and sent forward to consumers. Practically all users have come to the conclusion that specifications should be filed promptly to assure a favorable position on mill books.

Manufacturers of bar iron are booking business on an enlarged scale, largely dictated by inability to obtain soft steel bars. Railroads still are backward about placing orders, and without this assistance, mills have not been able to accumulate a backlog, although the excess of orders over deliveries is gaining. The quotation is steady at 2.72c, Chicago mill.

Manufacturers of hard steel bars rerolled from rails are quoted at 2.65c, mill, and under the present circumstances of a heavy demand for bars and a light supply of rerolling rails, they have been forced to turn down about as much inquiry as they have been able to accept. The rule seems to be to take care first of regular trade, and let others seek their supplies elsewhere.

Production Still Behind Demand

Pittsburgh, Oct. 28.—Although more bar mills are in operation this week than before since the outbreak of the strike, production still is far behind contract obligations and new demands are almost impossible to fill except out of warehouse stocks and these have become pretty much depleted as the result of the recent demand. A few of the important companies have withdrawn all their quotations on bars until it is definitely known whether there will be a strike of the coal miners on Saturday. The Carnegie Steel Co. is holding at the March 21 base of 2.35, base Pittsburgh, and under present conditions this price refers only to shipments against old obligations. Buyers in need of smaller sizes of rounds for immediate shipment probably would have to pay substantial premiums. A shortage of iron bars for prompt delivery also is indicated. Makers of iron bars not only are getting good demand from regular sources but also are disposing of fair sized tonnages to take the place of soft steel bars. Iron bars are firm at 2.75c, Pittsburgh, for common merchant iron and at 3.00c, for railroad.

Eastern Prices Tending Upward

New York, Oct. 28.—Quotations in the eastern bar iron market are tending upward, notwithstanding the fact that the market is dull. At least 25 per cent of the offerings appear to be made at the level of 2.75c, Pittsburgh. These higher offerings are due largely to operating costs. Export demand, which was in some evidence several weeks ago, has disappeared, and domestic buying is quiet.

Get Bars for Bolts

Chicago, Oct. 28.—Better deliveries of raw material for the manufacture of nuts and bolts have allowed some mills to reopen after being closed because of lack of iron and steel bars. This change has come about through the better production by steel mills affected by the strike, and in some measure gives an indication of increased operation now possible. Demand for bolts and nuts is excellent and mills have all the business they can accommodate.

New Orders Are Liberal

Pittsburgh, Oct. 28.—Makers of cold finished steel bars had a big volume of business before them and a number of new orders are coming along because of the inability of manufacturers in other districts to supply more contracts. Some of the non-integrated makers are suffering from the shortage of merchant steel bars, but shipments of the latter are somewhat better this week than they were recently, due to the fact that more merchant mills are in operation this week than before the strike began. The market on cold finished bars is firm at 3.60c base Pittsburgh.

Orders Are Piling Up

Pittsburgh, Oct. 28.—As operations of the hoop and band mills still are considerably below normal, production is falling behind specifications and a considerable amount of business is backing up. Few of the makers had any reserve tonnages when the labor trouble broke out and in trying to satisfy demands against old orders, they have practically no tonnage available for new demands. The situation in cotton ties is just the reverse of that in hoops and bands, as sufficient ties were rolled to meet the requirements of a much larger cotton crop than actually will be produced this year.

Tin Plate Sales

Made at $7 for Domestic, and $7.50 for Export Delivery in January

Pittsburgh, Oct. 28.—One of the Pittsburgh producers of tin plate which was not very heavily committed for December rollings is taking a limited amount of business for delivery in January at $7 per base box, Pittsburgh, for domestic accounts, and $7.50, Pittsburgh, on export orders. As a general rule makers of tin plate are committed at least to the end of this year and probably a little longer due to the dislocation of production and shipments resulting from the steel strike. Heavy export demands are noted and domestic consumers would be larger buyers if the tonnage was available. Production is gaining steadily as the American Sheet & Tin Plate Co. now has 60 per cent of its capacity in operation, and recent gains by the independents are being well maintained.

Limited Buying

Being Done in Ferroalloys—English Manganese at $100 Seaboard

Pittsburgh, Oct. 28.—A sale of 150 tons of ferromanganese constitutes the largest recent individual transaction in this market. This tonnage went to a Pittsburgh steel foundry. The material was imported, and the price was $100 c.i.f. Baltimore. All other demands have been small and comparatively few have resulted in sales. Domestic producers generally are holding 78 to 82 per cent material at $110, delivered, but it is intimated that they have shaded this price a few dollars. It is believed that a firm bid of $107.50, delivered, would not be refused by domestic producers. No demands of any consequence are noted for spiegeleisen in this market and only carload lots of 50 per cent ferrosilicon are being sought, and these in all cases are for immediate delivery. While a number of producers of the latter material are quoting $85 or higher, the more general basis of sales is around $80, delivered, Pittsburgh.

Not much interest is being taken in the lower grades of electrolytic ferrosilicon nor in that produced in blast furnaces. Production of bessemer ferrosilicon, however, is moderate and supplies are not such as to lead makers to sacrifice prices to stimulate demand. Domestic producers of ferrochrome have fairly strong price ideas, some of them quoting as high as 30 cents, while 25½ cents seems to be the minimum named recently by domestic producers. Quotations of 22 cents to 24 cents on this material are believed to refer to imported stock.

Will Pay $103 Seaboard

New York, Oct. 27.—Several consumers are said to be willing to buy English ferromanganese at $103, c.i.f. tidewater, but it appears that the metal is not obtainable at this figure, at least without first referring the bids to the English principals. Some English ferromanganese is offered at $105, c.i.f. but for shipment next year. The market on domestic metal still may be quoted at $110, delivered. One domestic maker is asking $115, delivered on ferromanganese for prompt shipment but has not yet sold at this figure.

Demand for spiegeleisen is quiet. The market still may be quoted at $33 to $35, furnace, for 18 to 22 per cent metal.

English Ferro is Reduced

Philadelphia, Oct. 28.—English makers recently reduced their domestic price on ferromanganese to a figure which considering exchange is equivalent to $100, tidewater. No offers

are being made here at present on English ferromanganese, however.

Pipe Advanced

By Foundries in East—Mill Sales Are Being Kept Down

New York, Oct. 27.—Prices have again advanced $2 in the eastern cast iron pipe market. Four-inch pipe is now $61.30, New York, and 6-inch and over, $58.30. These prices apply to class B pipe, while class A is $2 higher. The largest award during the past week involved 2000 tons for East Hartford, Conn., and went to the Warren Foundry & Machine Co. Public business has been negligible, and little of importance is in sight at the moment. Private buying continues to hold up well.

No Change in Situation

Pittsburgh, Oct. 28.—General conditions in the market for tubular goods are much as they have been during the past few weeks. Pittsburgh district manufacturers were less affected by the strike than those in other districts, but while they have not added to their obligations, the dislocation of production and distribution has much deferred the completion of the business they had on their books. The Jones & Laughlin Steel Co., has maintained normal operation of its pipe mills and the only plant of the National Tube Co., outside of that at Benwood, near Wheeling, W. Va., which was affected was the Pennsylvania works in this city. That plant now is running 50 per cent of capacity. Both these companies are making good shipments against contracts. The A. M. Byers Co., and Spang, Chalfant & Co., are recovering from the effects of the strike. A big shortage of all kinds of pipe is being built up because producers in the Wheeling district still are down, and Youngstown, O., manufacturers have not been able to increase production to substantial proportions.

Season Near End

Chicago, Oct. 28.—With weather suitable for excavation, laying of water mains almost at an end, inquiry and buying of cast iron pipe has almost disappeared. Occasional requests are received for carloads to be shipped promptly to fill out on jobs already under way, and in most cases delivery within 30 days is requested. Cities with contracts made earlier in the season are pressing for delivery and most shops are able to meet desires. While there is not sufficient backlog in most shops to assure operation through the winter, stocks have been drawn to a low point and it will be possible to operate for some time in replenishing these. Bids will be opened at Chadron, Neb., Nov. 3 on 1000 tons.

Offered Business for 1920

Birmingham, Ala., Oct. 28.—Cast-iron pipe plants in the Birmingham district are operating on full time with plenty of business in hand and more orders in sight. Business for 1920 is being offered.

Plates Feel Dock Strike

Heavy Export Deliveries are Held Up—Eastern Makers Sell at 2.65c Mill in West—Belgian Cars Call for 65,000 Tons

Philadelphia, Oct. 28.—The dock strike at New York is holding up the shipment of export plate orders and is having an embarrassing effect on eastern mills which have big backlog of foreign business. Domestic plate business reported as somewhat less active than any preceding week since the steel strike was called but is satisfactory. Among the leading eastern buyers at present are the Pennsylvania and Reading railroads which are taking good sized tonnages for car repairs, especially the former. The Chesapeake & Ohio has out an inquiry for a round tonnage of tank plates.

Export Plate Orders Plentiful

New York, Oct. 27.—Mills report that the majority of the plate orders which are offered here are from foreign sources, and chiefly from Japan. These are to be had at 2.65c, Pittsburgh, but the mills already are so well sold up that they do not care for this business, as a rule. There is some domestic demand for plates here but this demand is not as active as it has been of late in other sections of the country. At least one large lot has been let in this district during the past week, and another lot, 15,000 tons, is pending.

No Prompt Business Being Taken

Pittsburgh, Oct. 28.—One maker of plates in this district yesterday withdrew all quotations on plates because of the possibility of being unable to make shipments in the event of a strike by the coal miners. Little or no new business is being taken by makers here as they all became well sold up as a result of orders from consumers ordinarily served by other makers who were crippled by the steel strike. On all recent business 2.65c, Pittsburgh, has been obtained without any trouble, but no sales have been made at any higher price, although reports from the East have been to the effect that makers are getting as high as 2.75c, Pittsburgh.

Higher Prices Obtained

Cleveland, Oct. 28.—Plates are bringing higher prices in this territory and eastern mills are obtaining 2.65c mill, equivalent to 2.95c delivered Cleveland territory. Heretofore these makers have been equalizing the freight from Pittsburgh to this district, but now are adding the full freight from the mill. The Pittsburgh price of 2.65c is equivalent to 2.82c Cleveland.

Japs Take Small Lot

Chicago, Oct. 28.—The leading interest has booked 600 tons of plates for export to Japan for use by a shipbuilder, and a small lot of bars to be used in connection therewith. General plate demand is excellent and consumers feel it would be wise to place their specifications as early as possible to obtain position on rolling schedules. A Belgian inquiry for cars entails a requirement of 65,000 tons of steel chiefly plates.

No Rail Advance

Report Due to Misapprehension—Belgium Wants Many Cars

Pittsburgh, Oct. 28.—Recent rumors that the price of standard open hearth rails had been advanced to $49 Pittsburgh appear to be without foundation as the largest producer in this district still is holding at $47 and says that no attempt has been made to obtain any advance. The rail mills of the Edgar Thomson Works of the Carnegie Steel Co. resumed operations this week. As nothing has been heard recently relative to the rumored order for 200,000 tons of standard rails by the railroad administration, it is assumed that this business now will not go out until the railroads go back to private ownership. Good inquiries are in for light sections especially for export. The New York, New Haven & Hartford railway recently closed on 200 kegs of standard spikes and now is seeking 5000 kegs more. Outside of this business nothing important has been done in standard spikes. Sales of small spikes also are more moderate and makers have practically nothing available for this year.

Belgians Want 10,000 Cars

Chicago, Oct. 28.—An inquiry by the Belgian government for 10,000 four-wheel coal cars of 20-tons capacity is being entertained by builders in this country. This will require about 65,000 tons of plates, shapes and bars and 20,000 axles. It is understood one western builder is planning to send a representative to Belgium to assist in obtaining this contract. The Pullman Co. has taken a contract for 25 cars for the Arms Palace Horse Car Co. The American Car & Foundry Co. has taken orders for 280 tank cars for various users, 100 mine cars for the H. C. Frick Co. and 50 pit cars for the Holland Coal Co., Altoona, Pa. The Pennsylvania Tank Car Co. has taken orders for 424 tank cars for various users.

Railroads are figuring on their rail requirements for 1920, but are unable to get ahead with definiteness until their operating status after the first of the year has been decided more definitely. The western mill was started in operation this week after being down since the beginning of the present strike. Mills are full for the remainder of this year except for small emergency tonnages. Demand for light rails is increasing in spite of possibility of a strike by miners. It is believed plans are being made for carrying forward extensive repairs during the period of idleness if the miners go out.

Large Jobs are Pending

10,000 and 7,000-Ton Hotels at Detroit and Cincinnati Up for Figures — New Awards of Fair Amount

Cleveland, Oct. 28.—Demand for structural shapes continues in fair volume in Ohio and some districts of Michigan, and fabricators report they have all the business they can handle at present. Standard shapes for smaller building enterprises especially are in good demand, while several large building projects in Cleveland, Cincinnati and Detroit are coming to a head, general contracts having been let. It is apparent that considerable business will be closed before the end of the season's building activities. One Cleveland engineering company is reported to have plans prepared for nearly 50 rubber factories in various cities in Ohio for different interests. While many of these enterprises are waiting to be financed in many instances the companies concerned are seeking to begin building operations before cold weather sets in. Strenuous efforts are being made by trade union leaders to unionize the Michigan fabricating shops, but thus far they have not succeeded in hampering output. The biggest jobs in sight are 10,000 tons for the Biltmore hotel, Detroit; 7000 tons for the Gibson hotel, Cincinnati, and 5000 tons for the General Motors Co., Saginaw, Mich.

New England Work Holding Up

Boston, Oct. 27.—Structural bookings are holding up despite the influence of the steel strike. A contract was let to the Stone & Webster Engineering Corp., for construction of a $2,000,000 office building for the First National Bank of Boston. Actual work on this structure will not start before spring, and the amount of steel required has not been announced, although it is estimated at 3000 tons. Other work let during the week includes a $250,000 concrete 7-story factory for the Ace High Chocolate Co., Boston, which will take approximately 125 tons of steel, and a $150,000 concrete factory for Ellis & Hussey, Haverhill, Mass. The Daynor Realty Co., Norwalk, Conn., is taking bids for a five-story concrete factory to cost $350,000. Bids are also being taken for a $200,000 apartment building, Cambridge, Mass., a $100,000 manufacturing building at Pawtucket, R. I., and a $200,000 school house at Newport, R. I.

Outlook Better in East

New York, Oct. 27.—Outstanding among awards in the eastern structural market is a lot of 5000 tons for a loft store building at Seventh avenue and Twenty-ninth street, this city, for the Regent Construction Co. This business went to the Hay Foundry & Iron Works, which also received a couple of other smaller contracts during the past few days for construction work on Manhattan. Another sizable contract noted in the East is one placed with the McClintic-Marshall Co. for a plant for the West Virginia Metal Products Co., Fairmont, W. Va., involving 1300 tons.

While the market in the East continues to be somewhat depressed by the steel strike, several good sized tonnages have come out of late and buying, as compared with the early part of the month, is improving. In fact, the effects of the labor trouble are more in evidence at the fabricating shops, where difficulty is being had in obtaining shipments from the mills. Virtually none of the eastern fabricating shops, however, is having labor trouble of its own. Prices on the general run of fabricated material have varied but little.

Volume is Slightly Smaller

Philadelphia, Oct. 28.—Eastern shape mills report the volume of business as slightly smaller than in preceding weeks, but it is still at a good rate. Fabricators who are taking good tonnages report they are bidding on an unusually large total of fabricated work. Many ship contracts are reported.

Prospective Business is Good

Pittsburgh, Oct. 28.—Although the steel fabricating interests in this district recently have made comparatively few important bookings, a large amount of business is reported as being in prospect and likely to be placed once the labor situation becomes more favorable. Operations of the fabricating shops are normal in this district, although in some instances slightly affected because of the inability of the makers of plain material to make full and prompt deliveries. Shape mills in this district are well provided with business as a result of demands from buyers who ordinarily secure supplies elsewhere.

Western Building Slack

Chicago, Oct. 28.—After a fairly active period, construction in the west has dwindled and much less is coming through than had been promised. The largest tonnage closed during the past week involves 2325 tons for the Winfield hotel, at Fort Worth, Tex., awarded to the Mosher Mfg. Co., Dallas, Tex., which will obtain the steel from the Bethlehem Steel Co. The Iowa State university has let a contract for a cattle barn at Des Moines, involving 525 tons, to a local contractor, who has not announced the source of his steel. Plain material prices are unchanged at 2.45c, Pittsburgh, and 2.72c, Chicago.

CONTRACTS AWARDED

Power house for Philadelphia Electric Co., 500 tons, to the Phoenix Bridge Co.

Plant for West Virginia Metal Products Co., Fairmont, W. Va., 1300 tons, to McClintic-Marshall Co.

Addition to office building, Broadway and Leonard streets, New York, 200 tons, to Hay Foundry & Iron Works.

Addition to building of United Dressed Beef Co., Forty-third street and First avenue, New York, 300 tons, to Hay Foundry & Iron Works.

Winfield hotel, Fort Worth, Tex., 2325 tons, to Mosher Mfg. Co., Dallas, Tex.

Column shafts and cast bases for building for the Fulton Market Cold Storage Co., Chicago, 749 tons, to Lackawanna Bridge Co.

Extension to the plant of the General Electric Co., Erie, Pa., 700 tons to the Jones & Laughlin Steel Co.

Merchant bar mill building, Interstate Iron & Steel Co., Chicago, 800 tons to the McClintic-Marshall Co.

Loft store building for Regent Construction Co., Seventh avenue and Twenty-ninth street, New York City, 5000 tons, to the Hay Foundry & Iron Works.

Plant building for the Compresed Steel Shafting Co., Readville, Mass., 200 tons, to New England Structural Steel Co.

Mill building for the Royal Mills, Providence, R. I., 500 tons, to Phoenix Bridge Co.

Theater buiding, South Boston, 200 tons, to New England Structural Steel Co.

Factory building at Springfield, O., 300 tons; to Bellefountaine Bridge & Steel Co.

Building for Chandler Motor Car Co., Cleveland, 200 tons; to National Iron & Wire Co.

Sinton hotel, Cincinnati, O., 400 tons; to American Bridge Co.

Extensions for Whitaker-Glessner Co., Portsmouth, O., tonnage indefinite; to Fort Pitt Bridge Works.

CONTRACTS PENDING

Apartment house at Baltimore, 500 tons, contract pending.

Addition to department store, Springfield, Mass., 1100 tons, contract pending.

Fertilizer plant for Armour & Co., Chicago Heights, Ill., 400 tons, contract pending.

Bridge for Norfolk & Western, Columbus, O., 500 tons, contract pending.

Y. M. C. A. building, Columbus, O., 400 tons, bids in.

Substructure Madison street bridge, Chicago, 275 tons, bids in.

Building for Hershey Chocolate Co., 600 tons, Hershey, Pa., bids being taken.

Two government hangars at Newdorp, Staten Island, N. Y., 800 to 1000 tons, bids to close shortly.

Floating drydock at Baltimore, 1800 tons, pending.

Theater for Marcus Loew, Euclid and 101st st., Cleveland, 500 tons; bids being taken.

Theater for Marcus Loew, Euclid and 117th st., Cleveland, 850 tons; bids being taken.

Biltmore hotel, Detroit, 10,000 tons; general contract let to George A. Fuller Construction Co.

Building for General Motors Co., Saginaw, Mich., 5000 tons; general contract let to Wood & Co.

Ideal Tire & Rubber Co., Cleveland, 300 tons; inquiry out.

Gibson hotel, Cincinnati, O., 7000 tons; Gustav Drach, architect, taking bids.

Theater, Portsmouth, O., 200 tons; bids being taken.

To Build Auto Bodies

Chicago, Oct. 28.—The Pullman Co., which for many years was able to concentrate its entire energies on the construction of sperial equipment for passenger use, sleeping cars, dining cars, parlor cars and later branching out into the building of practically all sorts of railroad car equipment, has been forced recently to take on other lines of work to keep its organization together. The policy of the railroad administration has been such that the company has been unable to find sufficient business in its regular lines. For some time it has been building cabinets for phonographs in its woodworking department, and recently it took a contract from the Packard Motor Co. for building automobile bodies.

Premiums Paid on Export Goods

Independent Mills Enjoy Large Profits on Foreign Business Now Being Booked —Heavy Purchasers Striving to Keep Out of the Market for the Present — Orders are Closed for 1920 Delivery

NEW YORK, Oct. 27.—With the increase in difficulties of placing new orders with the mills, many export houses report that foreign purchasers are showing a tendency to hold off with their inquiries. As a result there has been a slight diminution in inquiries from some quarters, although it is declared by a few responsible firms that the export business being done today is extremely large. It is declared unanimously that many difficulties confront the placing of an order and mills do not desire to open their books to new business so long as present unsettled conditions continue. While the strike of the millworkers is practically broken, the longshoremen's strike drags along with a fair prospect of settlement. At present, however, the miners are threatening to go out and thereby cut off the fuel supply.

Notwithstanding the desire of some of the heaviest foreign purchasers to hold off the export demand is such as to necessitate the offering of premiums to bring forth the products. In some cases, it is declared, the exporter has been compelled to offer the mills a premium of 1, 2 or 3 cents per pound for the particular commodity, and in some cases mills have refused to accept orders on which the purchaser proposed to pay a premium of $2 to $3 a ton. One exporter reported that he had paid a premium of 20 cents per 100 pounds on galvanized sheets.

It was learned during the past week that some Oriental business has already been placed "at mills' convenience." In the contract signed for these goods, it was proposed to make delivery some time before July 1, 1920. This is the first instance disclosed of foreign sales being made for 1920 delivery. The particular sale involved 800 tons of structural shapes. The export house arranging the deal is hoping to be able to get delivery some time during February or March. Another Japanese order calls for 400 tons of galvanized sheets. The purchasers agreed to sign the order on the basis of a delivery at mills' convenience, but the export house will be protected by a letter of credit established in New York by the Japanese purchaser which will be limited to approximately three months.

The great increase in export business during the past month is probably represented on the books of independent mills. Both the largest export houses have been doing a business to the limit of their ability, however. According to reports current here the United States Steel Corp. contracted to sell 30,000 tons of steel to the Kawasaki Dock Yard Co., of Kobe, Japan. This is said to be shipbuilding material and the cost, it is reported, will approximate $2,700,000.

Another sale of ship material is reported to have been made by a Philadelphia house upon an agency basis, the ships to be built in Japan with the steel purchased from the steel company here. Many houses have accepted small orders for shipbuilding material from Japanese companies. Typical of the business being done by these export houses were orders reported from Japan for 600 tons of black sheets, 1200 tons of ship plates and 14,000 boxes of tin mill black plate.

A new Japanese inquiry is for 4500 tons of ship material for delivery during the first half of 1920. An order for approximately 200 tons of wire was booked for the Orient during the past week. The Orient also purchased 200 tons of light rails, and 30 tons of light sheets. Another house reported the sale of 2500 tons of light rails to the Orient. One order for 1000 tons of small steel plates, a small tonnage of tube steel and a smaller tonnage of bars was reported to have been received from China. China also is inquiring for 3000 tons of scrap and about 1500 tons of rails.

Some old orders for shipment of rails to the Dutch East Indies are reported held back because of the failure of the mills here to make deliveries. Considerable apprehension is indicated in cables from Dutch East Indies asking for immediate delivery of 3000 tons. An order for approximately 10,000 kegs of wire nails has been declined as a result of a dispute over the price.

The relay rail market in Cuba is active. One house has sold 270 tons of relays to Cuba. Cuba has also purchased 50 tons of light sheets. There is at present an opportunity to sell Cuba 4000 lengths of 4-inch soil pipe. Due to the demand not only from Latin and South America, but also from the Orient, some of the export houses declare they are flooded with inquiries for open-hearth and bessemer wire rods. It is practically impossible to obtain this product. Similar difficulties are being experienced in connection with tin plate. One house reported that tin plate orders for export have been refused at $7.25, Pittsburgh.

Sales of sheets to South America have been reported. South America is now inquiring for 4000 tons of new 60-pound rails. Heavy rails, however, are difficult to find. The American Locomotive Co. has received an order from the Central Railway of Brazil for five Consolidated type engines, and two Mallet type, from the United Verde Copper Co. Chile is inquiring for 50,000 tons of relaying rails.

The Nonferrous Metals

	‡Copper	Future Straits N. Y.*	†Lead, New York basis	Zinc St. Louis basis	Aluminum	Spot antimony	Nickel ingot
Oct. 22	21.75	54.25	6.50	7.75	33.00	8.62½	41.00
Oct. 23	21.75	54.25	6.75	7.80	33.00	8.62½	41.00
Oct. 24	21.50	54.00	6.75	7.80	33.00	8.75	41.00
Oct. 27	21.25	53.75	6.75	7.75	33.00	8.62½	41.00
Oct. 28	21.25	53.75	6.75	7.70	33.00	8.62½	41.00

*Future shipment from Singapore.
† American Smelting & Refining Co.'s price.
‡Open market.

NEW YORK, Oct. 28.—Departure of the leading copper sellers from their long established price of 23.50c did not stimulate the copper market to any great extent. The leading sellers dropped their quotation to 22.00c and did some business at lower prices. Second hand dealers immediately dropped their prices from around 22.50c to 21.50c, then to 21.25c. Dealers evinced some interest, but consumers, having large supplies of copper and also having their attention on the serious labor troubles, have not been active buyers. Speculators purchased and sold first quarter electrolytic at prices ranging from 21.50c to 21.75c.

The zinc market has been strong, largely based on export buying. Great Britain, France, Belgium and Japan have been buyers. Dealers also have been active in the market and have replenished their holdings. Consumers, on the other hand, including both galvanizers and brass mills, have been buying very sparingly. The prime western zinc market advanced about 10 points not the past week, the price on Monday being 7.75c, New York, but it was off a little today, 7.60c to 7.65c. High grade zinc is held at 8.00c to 8.25c, New York.

The American Smelting & Refining Co. advanced its lead price ¼c a pound Oct. 23 to 6.75c, New York, which followed a similar advance Oct. 16. Outside interests have been steadily asking and obtaining premiums. Lead is unquestionably in short supply. The outside lead market is about 6.75c to 6.85c, New York; 6.60c to 6.70c, St. Louis.

The London tin market has declined. The New York market is lower also while the Singapore price remains high. November and December shipment Straits tin from London could be had Monday at 53.25c, New York, while the same shipment from the Straits was held at 53.75c, and 53.50c to 53.75c today. Spot tin ex warehouse sold as high as 57.00c, while tin on dock, not available for immediate delivery, was quoted 53.75c.

Operations Show Steady Gains

Pittsburgh District Reports Furnaces and Mills on 80 Per Cent Basis While Companies in Chicago District Have 75 Per Cent of Their Men Back—Little Change at Youngstown—Southern Furnaces Prepared for Coal Strike

THE MOST notable gains toward a resumption of normal operations in the iron and steel industry have been made in the Chicago and Pittsburgh district, although the sixth week of the strike finds operators in all districts in a much more advantageous position than at any time since the strike was declared. In an effort to bolster up the waning hopes of the strikers various committees of trades union leaders are talking of issuing food cards, while the number of men reporting for work is steadily increasing in most of the districts still affected.

In the Chicago district the plants of the Illinois Steel Co. have 75 per cent of their former force at work, while the same percentage is reported by the Inland Steel Co. Both of these companies have increased operations at their furnaces and mills.

In the Pittsburgh district general operations have increased to 80 per cent at least. The Carnegie Steel Co. now has 39 of its 49 blast furnaces in blast, and work at practically all of its plants is moving toward normal.

In Ohio the most notable development in the strike during the past week, aside from an increase in operations at Cleveland, was the suspension of the mayor of Canton, O., by Governor Cox, following a riot at the plant of the United Alloy Steel Co., Canton. Native Americans were attacked by a mob of foreign agitators and six of them were beaten, one seriously. The governor decided to take a hand to insure protection for loyal workers when local authorities failed to act, and 1000 militiamen were sent to Akron, O., nearby, ready for immediate despatch to Canton in the event of further disorder.

In Youngstown operating conditions have not changed much since last week, while in Cleveland some gains are reported by mills and furnaces. Five hundred men have now returned to the H-P nail works of the American Steel & Wire Co. and the company is operating its coke plant on a partial basis. The McKinney Steel Co. now has one-half of its open hearths in operation, while its blooming mill and one furnace started last week are continuing. The Otis Steel Co.'s Riverside plant now is operating at 100 per cent.

In the Buffalo district, the Donner Steel Co. reports the return of 1000 of its workmen, and, in addition to its other operations begun last week, a 14-inch bar mill is to be placed in operation this week. More men have returned to the plant of Rogers, Brown & Co., while 2500 men are now at work at the plant of the Lackawanna Steel Co. Other plants in the Buffalo district are operating at 100 per cent.

The situation in the East, New England and in the southern states has so far improved that the strike in those districts is considered at an end. The furnaces and mills in the Birmingham district are prepared for a strike of coal miners and it is said that the prospective strike will not interfere with their operations to any great extent unless it should be protracted. The Woodward Iron Co. has banked the Vanderbilt furnace to conserve fuel.

Workers Beaten; Ohio Mayor Suspended

CLEVELAND, Oct. 28.—Aside from outbreaks of violence at steel plants in Canton, O., which were quelled after Governor Cox ordered out 1000 state militiamen, strike conditions throughout Ohio have continued to improve steadily. More men have reported for work and many plants are reporting they are operating at almost normal capacity.

The calling out of the state troops by Govrnor Cox, followed the outbreak of lawlessness on the part of striking workmen at the plant of the United Alloys Steel Co., Canton, last Friday night and Saturday. At this plant, six workmen employed by the company, all native Americans, were beaten by a crowd when they left the plant, one of them being seriously injured. In the rioting which followed many shots were fired and for a time the situation got beyond the control of the municipal authorities. At a meeting in Governor Cox's office at Columbus, O., Monday, Mayor Poorman, of Canton, was suspended for 30 days, pending a hearing, because of his failure, according to the governor's charges, to do all in his power to provide adequate protection. Governor Cox has appointed an acting mayor and this official plans to increase the police force and furnish the mills in the district all the protection necessary. The militia encamped at Akron, O., ready for service if necessary at Canton.

At Cleveland operations are in progress at practically all plants. More than 500 men have returned to the H-P nails works of the American Steel & Wire Co. The company's coke plant is operating on a partial basis, but its other plants have not been reopened, although many men have reported for work. One furnace is in blast at the McKinney Steel Co.'s plant, while half of the company's open hearths and the blooming mills are operating. The Upson Nut Co. is oprating on a small scale, while one blast furnace of the Cleveland Furnace Co. is running. The Lakeside plant of the Otis Steel Co. is in partial operation, while the company's Riverside plant is working 100 per cent. General indications point to normal operations here soon. Operations at the plant of the National Tube Co., Lorain, O., have not been affected.

Operations at 80 Per Cent in Pittsburgh District

Pittsburgh, Oct. 28.—General operations in the iron and steel industry in the Pittsburgh district have increased to 80 per cent or more. Strikers are continuing to return in large numbers, except for the common laborers who are slow in getting back. The Carnegie Steel Co. has 39 out of 49 blast furnaces in operation. Its ingot capacity in Ohio and Pennsylvania is 70 per cent engaged. Its Homestead plant is operating at 85 per cent of capacity, while at its Ohio works five open hearths and six bar mills are in operation. Its McDonald, O., plant is down because of the lack of power. The Clairton by-product plant is operating normally,

and construction work has been resumed, including work on a retaining wall along the river. The Edgar Thompson works is operating at a better rate than at any time since the beginning of the strike. All its finishing mills are now in operation. The rail mill was started today. The Carnegie company also has started one bar mill at its Monessen works which is the first unit at the plant to resume since the strike. Much interest attaches to a meeting of steel company railroad employes scheduled for tonight in Pittsburgh.

Buffalo Furnaces and Mills Make Steady Gains

Buffalo, Oct. 28.—Despite claims of the union organizers that few skilled steel workers are returning to work, operating conditions of the mill and furnace in this district continue to improve. All operations begun at the plant of the Lackawanna Steel Co., including the blowing of a blast furnace and the operation of some open-hearth units have continued, and men are continually reporting for work. It is believed that more than 2500 men are working at this plant. The Donner Steel Co., reports the return of over 1000 of its men, and the continued operation of one blast furnace and certain other units. A 14-inch bar mill is expected to be placed in operation by Wednesday. The return of a number of men at the plant of the Roger-Brown Iron Co. is reported. Other furnace and mills in this district continue 100 per cent operation. The parade of strikers on Saturday night was a keen disappointment to strike leaders, while they claim 12,000 men merched the real figure is reported to have been nearer 3000.

Little Change Reported in Mahoning Valley

Youngstown, O., Oct. 28.—Little change in steel plant operating conditions throughout the Mahoning valley is in evidence this week. Two stacks of the Republic Iron & Steel Co.'s Haselton group of blast furnaces are supplying metal for four open-hearth units. This company plans to place several finishing departments under power this week. The Youngstown Sheet & Tube Co. has all departments, including six open hearths in operation.

The Carnegie Steel Co.'s bar mills at the McDonald plant and at the Lower Union works are rolling. At its Ohio works the company has one bessemer converter blowing and is tapping metal from one blast furnace and two open-hearth furnaces. The blooming mill at this plant also is running. The Brier Hill Steel Co. continues to operate one blast furnace, its coke ovens, five open hearths, its blooming mill and one plate mill.

Two sheet mills were started Tuesday afternoon by the Sharon Steel Hoop Co., members of the Amalgamated Association of Iron, Steel and Tin Workers returning to work in accordance with their contract.

At Niles, O., the situation is quiet. Not a roll is turning in any of the sheet mills and it is stated that the mill men, who are on a strike, have been instrumental in calling a sympathetic strike of the majority of the building-trade workers there. All construction work in Niles ceased last week and remains at a standstill.

Those following the strike situation in Youngstown state that the city is swarming with I. W. W.'s and anarchists who are making every effort to encourage strikers to hold out even though they have to resort to underhand tactics. They are said to have caused several disturbances last week such as the cutting of automobile tires in order to prevent workmen being hauled inside the works. Near the Brier Hill Steel Co.'s plant two houses which belonged to employes of that company were set on fire, the incendiaries having been shot by policemen. Many of the strike leaders operating in this district are noted agitators and it is believed if ample protection from rowdies and pickets was given, fully 90 per cent of the mill men would return to work immediately.

More Furnaces Active in Chicago District

Chicago, Oct. 27.—That the steel strike is ended in the Chicago district is a statement relatively true, although subject to some reservation. Plants of the Illinois Steel Co. are operating with an average of 75 per cent of their force and producing about 50 per cent of normal output. This discrepancy is due to the fact that reorganization of forces has not advanced sufficiently to give ordinary efficiency. At the Gary plant eight of 12 blast furnaces are producing iron, while at the South Works only five of 11; at Joliet one of four, and at Milwaukee one of two are active.

The Inland Steel Co.'s plant at Indiana Harbor now has about 75 per cent of its force back on the job and is blowing two of three blast furnaces. The third furnace is being relined.

The Gary plant has as many men as it can handle at present and will increase its force only as the men can be placed advantageously. A large number of former employes will not be taken back. They include those whom the government has found are active in spreading revolutionary doctrines.

Since troops have been maintaining order in Gary and Indiana Harbor, the return of workers has been rapid.

Some uneasiness is caused by the possibility of a sympathetic strike on the part of railroad men.

Alabama Furnaces Prepared for Coal Strike

Birmingham, Ala., Oct. 28.—While there is hope that the government will avert the coal strike, preparations are being made in the Birmingham district for emergencies. It is estimated that coal production in Alabama is not less than 80 per cent of capacity of the mines. Retail yards claim to have about a month's supply on hand. Steam coal is being shipped down the Warrior river for Mobile and New Orleans shipping interests, and it is said the mines along the river will not be affected by the strike, the men having promised to remain at work. The state has made preparations to maintain order, while the sheriffs of the coal counties are prepared for emergencies.

The banking of the Vanderbilt furnaces by the Woodward Iron Co. to economize on fuel is not considered particularly significant. Furnace companies of this district expect a minimum of trouble. Mine unions claim a membership of between 12,000 and 15,000, and leaders say that a large percentage of the remaining 25,000 employed in the coal industry in the district also will cease work Nov. 1. Operators do not believe that the union has more than 8000. Alabama's coal production now is about 325,000 tons a month.

Will Resume on Nov. 3

Cincinnati, Oct. 27.—A statement has been issued by officials of the Andrews Steel Co., and the Newport Rolling Mill Co., Newport, Ky., that they expect to resume operations in all departments Nov. 3. The plants have been idle several months on account of labor troubles.

Call Annual Meeting

The annual meeting of the National Founders' association will be held at the Hotel Astor, New York, Wednesday and Thursday, Nov. 19 and 20.

Minimum Effect

Of Steel Strike Shown by Steel Report—August High Mark

The minimum effect of the steel strike, which began Sept. 22, on steel earnings during the third quarter is indicated by the report of the United States Steel Corp., for the three months ended Sept. 30, which shows for the period the highest quarter earnings attained during the current year. Total earnings after operating expenses and federal taxes were $40,177,232, as compared with $42,961,589 for the corresponding quarter of 1918. The report does not disclose the sum charged off from earnings for estimated taxes.

The crippling force of the short period of the strike in the quarter was felt to some extent, however, as is indicated by the fact that September earnings represent a decline of 16 per cent from the high total reach for August.

The surplus for the quarter after regular dividends was $11,105,167, which compares with a surplus of $5,308,587 for the previous quarter and with $4,822,316 for the initial quarter of the year. The comparative income account for the 1919 and 1918 third quarters follows:

	1919	1918
July	$13,567,100	$15,261,107
August	14,444,881	14,037,613
September	12,165,251	13,612,896
Quarter - earnings after operating expenses and federal taxes	40,177,232	42,961,589
Depreciation and sinking funds	11,065,803	10,892,197
Net income	29,111,429	32,069,392
Interest and bond premium	5,347,562	5,404,081
Balance	23,763,867	26,665,311
Preferred dividends	6,304,919	6,304,919
Common dividends	6,353,781	*16,520,031
Surplus for quarter	11,105,167	3,840,591

The August earnings established the highest record for that month since August of 1917 and the highest for any month since July of 1913, when the earnings were $15,261,107. The total net earnings for the quarters of 1919 to date follow:

First quarter	33,513,384	
Second quarter	34,331,301	
Third quarter	40,177,232	

Acquires Furnace Plant

The Iron Products Corp., which has recently acquired the Essex Foundry Co. and the Central Foundry Co., has purchased the properties of the Chattanooga Iron & Coal Corp., Chattanooga, Tenn., consisting of one modern skip-fed blast furnace and 20,000 acres of developed coal and ore lands tributary thereto. The Iron Products Corp. likewise owns and operates the Tuscaloosa furnace at Holt, Ala., with coal mines, Semet-Solvay by-product ovens and ore mines. The nine foundries of the company, located in the north and south, are thus amply protected for metal. The combined annual output of the furnaces is in the neighborhood of 200,000 tons. Any surplus metal will be offered for sale.

Replogle Steel to Take Wharton Property

The Replogle Steel Co. is being organized to take over the mines, ore fields and blast furnaces of the Wharton Steel Co., Wharton, N. J., and the Wharton & Northern railroad which leads from the company's mines to its plant. No official statement has been issued regarding the new company but it is stated that its formation will mean the eventual extension of its activities to embrace the manufacture of steel products on a broad scale. It also is understood that some 250,000 shares of no par value capital stock will be issued by the new company and that the issue has been underwritten by Kuhn, Loeb & Co., at $50 per share. It is expected that an offering of the stock in the neighborhood of $55 per share will be made sometime this week.

The Wharton properties were purchased three years ago by a syndicate headed by J. Leonard Replogle, who became head of the company, but retired temporarily while he served as director of steel supply for the war industries board. At the time of purchase much of the property was in a rundown condition. Since then, the J. Leonard Replogle mine has been developed and now is estimated to contain more than 100,000 tons of high grade iron ore.

To Erect New Stack

Chicago, Oct. 28.—The Steel & Tube Co. of America is taking bids for the construction of a blast furnace stack to be erected at once either at the plan of the Iroquois Iron Co., at South Chicago, or at the company's new plant at Indiana Harbor. This will be a merchant stack, of large capacity, and probably will follow closely the lines of the two stacks recently built by this interest, one at South Chicago and the other at Indiana Harbor. Construction will be started as early as possible. It is expected the new stack will be put into service the latter part of 1920.

More Production

Palmer Tells Massachusetts Manufacturers Will Solve Problems

Greater industrial production was the keynote of an address made by Atty. Gen. A. Mitchell Palmer, before the fourth annual meeting of the Massachusetts Associated Industries held at Boston, Oct. 24 and 25. The sessions brought together nearly 600 manufacturers of the state for the purpose of discussing industrial problems. Mr. Palmer who spoke on the subject, "Costs and Production," declared that the best means of reducing costs is by increasing production. "Americans can produce more in their mills and factories than any people on earth," he said, "and the one great thing which will bring back normal conditions to America is the utmost production of the normal American men and women. The question naturally asked is, how is this increased production to be brought about? One way is through education. We must advertise production necessity."

Speaking before one group of the session, Herbert O. Stetson said that arbitration cannot help but fail where demands are always on one side and concessions on the other, and that the best way out is to cultivate friendship with the fair and honest element in the labor unions. Charles F. Weed, vice president First National bank, Boston, talked on possibilities of trade in China. Collective bargaining which was the rock on which the Washington industrial conference split, was defined by Frank T. Dresser, general counsel for the organization.

Edgar J. Rich addressed the association on the subject of industrial transportation problems peculiar to New England. He pointed out the difference between the problem of New England industries, and that of industries in other parts of the country. He spoke of the threatened passage of a rigid long and short haul clause.

Hearings to Commence

Washington, Oct. 28.—The federal trade commission announced today that hearings on the steel price basing point controversy raised by the Western Association of Rolled Steel Consumers against the United States Steel Corp. and other producers, will begin at 10 o'clock Tuesday morning, Dec. 2. So far over 100 producers and consumers have expressed their views on the subject and with the commencement of hearings they will be given an opportunity to submit oral testimony.

Baltimore Plant Makes Steel for English Airplane Motors

Fig. 1—Largest seaplane in world equipped with five 360-horsepower engines of type mentioned in accompanying article

Airplane Parts of Electric Steel Forged and Machined in United States and Assembled in England.

OUT of the vast destructiveness of war and its general setback to civilization, trade and industry have grown certain advantages resulting from the operation of the law of compensation. Success of arms depends to a large degree upon the genius of the peoples of the nations waging a conflict and this never was more true than in the case of the recent war. Chemists, metallurgists, manufacturers, engine builders, inventors—in fact all the representatives of the sciences, arts and crafts, were called upon to intensify their endeavors so as to product instruments that would be of aid to their respective countries to bring victory. Because of the immense importance of steel and the great part it plays in war as one of the prime essentials, no greater responsibility rested with any line of producers during the conflict than with the manufacturers of steel. America having come into the struggle, her manufacturers were stimulated in their eagerness to serve their country and the associated powers.

While lines of specialization and high quality had been operating successfully in the United States before the war, when it came manufacturers learned that they were to be called upon for vastly increasing and new demands to supply vital parts of steel that must be absolutely dependable. This demand, strengthened by the war, continues to reflect great volume and the increased attention paid to the making of high quality steel marks a new turn in this branch of the iron and steel industry.

A splendid example of the demand for quality steel during the war, and which has developed in connection with pursuits of peace, is found in the requirements for special steels for airplane parts. It is generally conceded that in airplanes the design and construction of each part are subjected to the supreme test. American steelmakers were asked to and did produce material for such parts, not

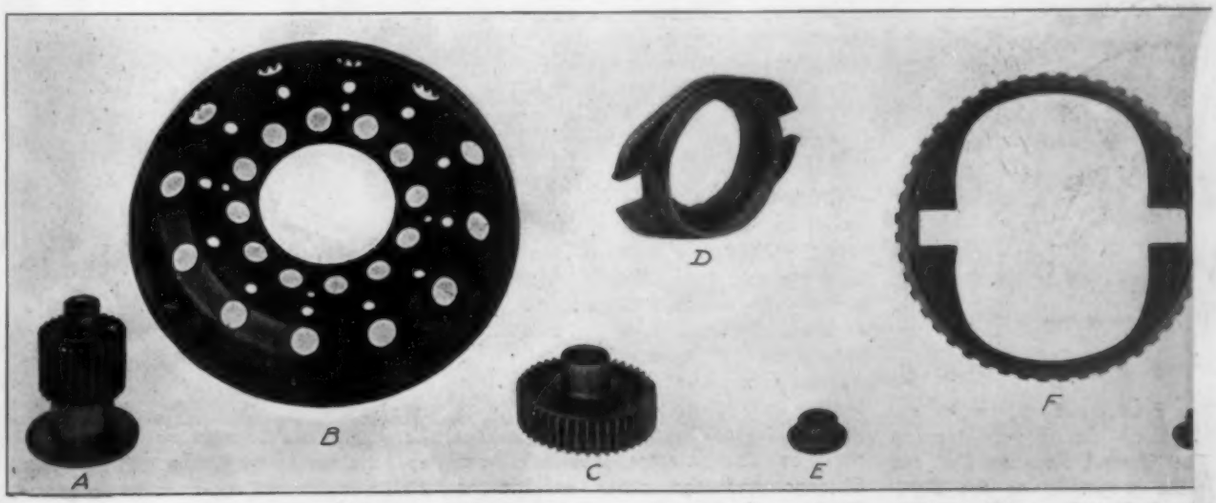


FIG. 2—PARTS FOR ENGLISH AIRPLANE MOTORS MADE FROM AMERICAN STEEL

A, C, Planet gears; *B,* Annulus gear which bolts to end of crankshaft; *D,* Sun wheel carrier; *E, G,* Planet wheel bushings; *F,* Anchor plate which permits adjustment for alignment

FIG. 3—COUNTERBORED CAMSHAFT FOR ROLLS-ROYCE AIRPLANE MOTOR

only for parts for American airplanes, but also for the well-known Rolls-Royce eagle motors. Moreover, the high-grade machining work for these parts was done in the United States. The manner in which United States interests were called upon to produce and machine steel for Rolls-Royce engines is a bit of war history that is not generally known. About two years ago representatives of Rolls-Royce, Ltd., England, came to the United States to look into the possibilities of getting certain parts of the Rolls-Royce engines made here. Among other steel sought was the 5 per cent case-hardening grade. A trial order was placed with the Hess Steel Corp., Baltimore. The steel was produced, given a thorough test, and met the severe requirements in every respect. It was then decided to give the Hess corporation orders for the manufacture in this country of all steel requiring the following analysis: Carbon, 0.08 to 0.14 per cent; silicon, 10 to 25 per cent; phosphorus and sulphur, under 0.03 per cent each; manganese, 20 to 35 per cent and nickel, 4.80 to 5.40 per cent. The steel was made for the manufacture of complete airplane parts for eagle motors which were installed in machines used for all military purposes such as bombing, fighting and scout work. With the signing of the armistice the interest in air transportation has been receiving unprecedented attention and the motors still are in great demand. Fig. 1 shows a seaplane, said to be the largest in the world, which is equipped with five 360-horsepower Rolls-Royce engines. The Hess corporation made the forging bars and finished machine bars for the airplane parts, while the forging was done by the J. H. Williams Co., Brooklyn. The Williams company shipped the forging to the other companies for the machine work. These latter were the H. H. Franklin Mfg. Co., Syracuse, N. Y.; the F. B. Stearns Co., Cleveland; the Taft-Pierce Co., Woonsocket, R. I., and others. The companies doing the machine work also did the heat treating and case hardening. The completed parts were then shipped to Derby, England, where the Rolls-Royce eagle engines were assembled and installed in the planes. The parts illustrated in Figs. 2 and 3 are typical of the forged and machined work turned out in these American plants during the war, and are used in engines varying from 280 to 360 horsepower, of the type illustrated in Fig. 4. The Hess Steel Corp. has six Heroult electric furnaces as illustrated in Fig. 5.

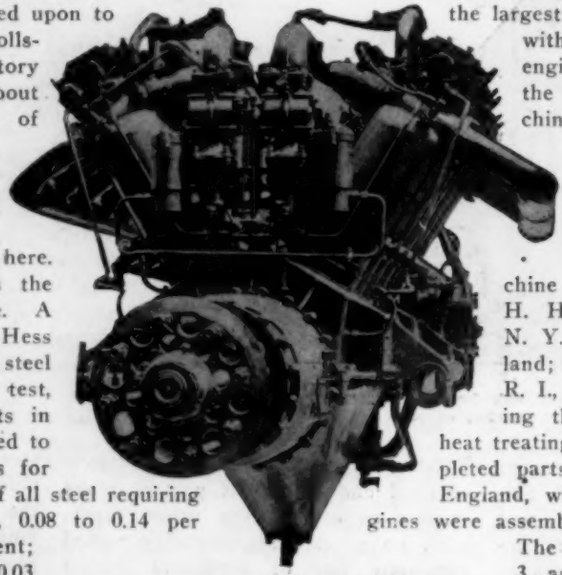


FIG. 4—TWELVE-CYLINDER 360-HORSEPOWER ROLLS-ROYCE AIRPLANE MOTOR

FIG. 5—BATTERY OF SIX HEROULT ELECTRIC FURNACES IN PLANT OF HESS STEEL CORP., BALTIMORE

Germany a Future Tool Factor

Will be Formidable Competitor in World's Machinery Markets—Manufacturers Now Harassed by High Taxes, Slacking Labor and Depreciated Currency—Best Features of American Tools Copied or Adopted

BY ALEXANDER LUCHARS

DEFEAT has not changed Germany's characteristics, good or bad, but it has changed her opinions and ideals. If she breasts the winter of 1919-20 without another revolution, and the chances are she will, Germany will enjoy a period of gradually improving industrial conditions. Food will be more plentiful and therefore cheaper; the mark will be worth more; wages will not be lower but men will be more willing to work and production percentages gradually will increase. If this forecast is correct, Germany will, in a few years, become a formidable competitor in the machine tool markets of the world. At present, however, the exact opposite of the conditions outlined is true.

After carrying out the terms of the armistice as regards coal for France, Germany will have left for the winter of 1919-20, approximately 40 per cent of what she used last winter. The shortage will doubtless be increased further by the prevailing strikes and through loafing and slacking. This shortage will of course affect factories so that many will close down or operate on reduced time schedules. It is expected that full wages will be paid in such cases, part by the government, part by the employers; thus adding to the already crushing taxes.

Present taxes often work severe hardships. One maker of small tools, who had been in business 50 years, sold out for 1,000,000 marks. The new tax law took 800,000 marks and because the income on the remainder was not sufficient to live on, he went to work again at the bench in the shop he formerly owned. In addition to taxes on income and profits, those on principal or business capital range from 15 to 65 per cent, although payment can be made in 30 annual installments at 6 per cent interest.

Employers are harassed by labor's demands and restrictions; the difficulty of obtaining material; of disposing of their product when ready; depreciated currency; and many smaller factors, all in addition to the matter of taxes. But the future is not all gloomy. Some say that if the workmen will only work for whatever wages can be agreed upon, the other evils can be taken care of in time. Some believe labor is beginning to see that demoralization in fundamental conditions affects working people more than any other class, and that some reasonable working basis must be reached on which the employer and employe can stand.

LAST May, the author of this article, Alexander Luchars, who is president of the Industrial Press, New York, publisher of Machinery was appointed by the department of commerce as special trade commissioner to acquire first hand information regarding the machine tool situation in Europe. His report on conditions in Great Britain, already has been published. This present report of conditions as he found them in Germany is published under his own signature, since he resigned as trade commissioner from the department of commerce on Oct. 1. The article is dated Oct. 8, although it was written in Berlin two months prior to that time. Mr. Luchar's report to the department of commerce, dealing with European markets for machine tools in a general way, has been published by that department under date of Oct. 11, although written in Paris on Sept. 8, 1919, while Mr. Luchars still was trade commissioner. It will be presented in a subsequent issue of THE IRON TRADE REVIEW.

A law has been introduced in the national assembly giving a representation in the management of each business to the workers, but many manufacturers do not think that such a representation would mean interference. Partial strikes in departments of vital importance to the works are a favorite resort; for in such cases the workers in the departments not on strike come to the shop and play at working, but produce almost nothing for lack of material, causing great loss to the management which must pay their wages. In the case of total strikes no wages are paid. One serious obstacle to industrial stability and progress is the lack of a recognized national executive.

Will Not Regain Former Place

No one with whom I talked believes that Germany will ever regain her former position. Conservative business men say that the return to normal economical conditions is not a question of months but of years; one, whose opinion has great weight with me, puts the time at 5 to 10 years. Food now controls the situation, and unless it becomes more abundant and cheaper during the coming winter, many expect another revolution. The supply of certain kinds of food fortunately is increasing, although meat and bread cards still are required. The former entitles the holder to two portions of meat and the latter to five slices of black bread daily.

Prices of all kinds of labor, metals and materials, and especially of machine tools, naturally have increased much more in proportion than in America. Prices have increased since the armistice, although the supply of labor should be greater.

A general comparison of wages paid to machinists and machine shop workers in 1914 and 1919 is given below:

	Wages per hour	
	1914	1919
Lathe hand	M. 0.60 to M. 0.75	M. 3.25 to M. 4.00
Milling machine hand	0.56 to 0.60	2.55 to 3.50
Planer hand	0.60 to 0.72	2.90 to 3.75
Assembler and fitter	0.56 to 0.70	2.70 to 3.60
Drilling hand	0.48 to 0.56	3.00 to 3.50
Blacksmith	0.95 to 1.15	3.50 to 4.00

On piece work the man must be guaranteed a minimum wage of about 25 per cent more than for day work. No large wages are earned at piece work, since the men will not produce more than an average amount of work under any conditions.

The above figures, however, do not afford an accurate comparison of labor costs on account of time lost loafing, talking and "slacking." In the machinery industry the average hourly product under the 8-hour day is about 50 per cent of what it was in 1913-14. In the Ludwig Loewe works I was told that the product per man per hour for the first six months of 1919 was 52 per cent of what it was in 1913-14. In some works it is much less.

Besides the increased wages and diminished output, manufacturers must reckon with extra bonuses or contributions in cash, up to M. 800 for each person or member of the organization such as foremen, draftsmen and superintendents, to enable them to pay their debts. The upper class employes have been giving more trouble lately than the workers.

All over Germany the 8-hour day

prevails, but the division of the day varies in different localities. In most Berlin machine shops the workers start at 7 o'clock, work until 12.10 p. m., take 20 minutes for lunch, and quit at 3 in the afternoon. On Saturday the quitting hour is 1, making 44½ hours a week.

Raw Material Prices Increase

The following figures give an idea of the increases in the prices of materials from 1914 to 1919. The heavy increases in the prices are due not to profiteering, but to greatly increased manufacturing, transportation and other costs. Foundry pig iron, which was quoted at M.74.50 in the second quarter of 1914, was quoted at M.215 in the first quarter of 1919, and M.356.50 in the second quarter of this year. Prices have now been lowered by M.52 to M.90 per ton, but the pig iron union states that the blast furnaces are working at a heavy loss.

The materials used in making pig iron have, of course, increased accordingly, coal briquettes having advanced from M. 13.75 to M. 66.10, and blast furnace coke from M. 17.00 to M. 88.85 per ton.

The advances of prices for raw and half-finished products are given in the following table; the prices given are marks per ton:

	Ingots	Billets
May, 1914	M. 82.50	M. 95.00
Jan. 1, 1919	285.00	300.00
March 1, 1919	385.00	400.00
May 1, 1919	405.00	475.00
	Sheet Billets	Sections
May, 1914	M. 97.50	M. 110.00
Jan. 1, 1919	305.00	320.00
March 1, 1919	405.00	420.00
May 1, 1919	480.00	520.00

Copper is now selling at M. 5125 a kilogram (official price). High speed steel sells for M. 27.50 per kilogram.

The following table, compiled by Prof. Schlesinger, an authority on the subject, gives the output of German machine tools from 1913 to 1918, and a comparison of prices as well:

Year	Production in Million Marks	Selling Price, Mark Per Kilogram	Production in Tons
1913	1060	1.00	1,060,000
1914	1045	1.10	950,000
1915	695	1.30	530,000
1916	660	2.00	330,000
1917	1720	2.50	680,000
1918	780	3.00	260,000

Many varying estimates have been made of the value of machine tools now in stock in Germany, but conservative authorities place the amount at between M. 200,000,000 and M. 300,000,000, which is a normal figure. This does not include tools owned by the government, but those are not expected to come on the market. The tools in private stocks are said to be second or third rate products; and this statement is supported by the fact that nearly all first-class German machine tool makers are behind in their deliveries, several claiming from six to nine months.

All German prices must be considered in relation to the impaired value of the mark, which is now quoted at about 17 to a dollar, as compared with 4¼ in 1914. Its effect on imports into Germany is evident, and establishes prohibitive prices for American-made machine tools. The price of German machine tools was advanced three times by the government during the war, 43½ per cent in 1917, and in 1918, 66 per cent over the 1917 prices. No further government advance was made, but manufacturers advanced prices from 20 per cent to 40 per cent at the end of 1918; and many prices have further advanced (except on war material tools) during 1919. Special machines for peace-work use advanced up to 200 per cent, and some small machine tools as much as 500 per cent over 1914 prices. But German tools of the best makes still sell for considerably less than similar American tools can be sold for according to the following 1919 prices for best makes of German machine tools furnished me by two well known German dealers:

Gap lathes, 12-inch, 3½ feet between centers	M. 3400
Gap lathes, 16-inch, 3½ feet between centers	4800
Gap lathes, 16-inch, 5 feet between centers	5100
Gap lathes, 18-inch, 3½ feet between centers	4500
Gap lathes, 20-inch, 5 feet between centers	7400
Gap lathes, 20-inch, 7 feet between centers	7750
Gap lathes, 26-inch, 7 feet between centers	10300
Engine lathes, with gap, lead-screw and feed rod, 16-inch, 5 feet between centers	7000
Engine lathes, with gap, lead-screw and feed rod, 18-inch, 3½ feet between centers	8000
Engine lathes, with gap, lead-screw and feed rod, 18-inch, 5 feet between centers	8500
Plain milling machines (according to size)	from M. 4000 to M. 9000
Universal milling machines (according to size)	from M. 7500 to M. 8500
Vertical milling machines	7200
Crank shapers, 14-inch	4200
Crank shapers, 18-inch	5000
Crank shapers, 22-inch	7000
Drilling machines, 20-inch	1300
Drilling machines, 22-inch power feed	2700
Four-spindle automatics, 1¾ and 2½-inch	M. 26,000 to M. 27,500

German Prices Lower

ON ACCOUNT of their greater accuracy, American-made machine tools of the best makes will sell for much better prices than German machines of the same type and size. No American machine tools have come into Germany for about three years except those that have been shipped through Holland and Sweden, hence no reliable comparisons can be made between 1914 *selling prices and prices that would have to be received now. Judging from what former agents of American manufacturers have told me, however, the figures would range from four to seven times what they were in* 1913-14 *and from* 50 *to* 75 *per cent more than similar German tools sell for. One dealer estimated that an American* 14-*inch lathe, which sold for M.*2000 *in* 1914, *now would bring M.*11,000 *to M.*12,000, *while a German tool of the same kind would sell for M.*6000 *to M.*7000. *A Gleason bevel gear planer, which sold in* 1914 *for about M.*9000, *now would have to be sold for about M.*60,000. (*The German mark now is quoted at about* 17 *to the American dollar as compared with* 4¼ *in* 1914.)—*Mr. Luchars.*

However, I believe that the above prices are lower than those for which first class machines can be bought. The following table gives a comparison of prices of German machine tools; all prices are subject to change from day to day many makers refusing to quote until tools are ready for delivery:

	1914	1919
High speed engine lathe, geared head, 18-inch, 3½ feet between centers	M. 2800	M. 9000
Tool room lathe, 14-inch, 3½ feet between centers	2400	8600
Milling machines, hand	230–280	950
Plain, three different sizes	800	2700
	2600	8100
	4400	13000 to 14000
Universal, including head	3500	10000 to 12000
Radial drilling machines, 3½ feet	2400	8000 to 10000
Radial drilling machines, 5 feet	4800	16000 to 18000

American Tools Are Copied

German manufacturers are turning out far better tools than they did in 1913-14. The designs of many well known American tools are followed, some are faithfully copied and others adapted. The list given below includes makers of characteristic types of American tools which had a ready sale in Germany before the war. General or standard machine tools, such as plain, vertical and lincoln type milling machines, sensitive and upright drilling machines, vertical slotting machines, planers, shapers, engine lathes, tool grinders and many other tools, which were manufactured more or less along American lines before the war, have been taken up in increasing quantities since 1914, by a considerable number of German makers. It is not the intention to include any of these in the following list of machines copied or adapted:

Acme Machine Tool Co., Cincinnati, O.; 2¼-inch size geared head machine made by F. A. Scheu, G. m. b. H. Berlin.

Acme Machinery Co., Cleveland; bolt machinery made by Concordia Maschinenbau, Halle a. S. and August Meiselbach Nachf., Leipzig.

Baker Bros., Toledo, O.; two sizes of keyseaters made by A. H. Schutte, Koln-Deutz.

Bilgram Machine Works, Philadelphia; machines licensed to J. E. Reinecker, Chemnitz-Gablentz, are now also made by a firm in Leipzig.

Blanchard Machine Co., Cambridge, Mass.; grinder brought out by Schuchardt & Schutte, Berlin, with round and square table.

Brown & Sharpe Mfg. Co., Providence, R. I.; small screw machines, made in large lots and first-class workmanship by Samsonwerk, G. m. b. H., Berlin; while Ludwig Loewe & Co., Berlin, have also brought out another machine of this type; the No. 2 surface grinder also is made in large lots by Samsonwerk in Berlin and sold at the price of M. 5750; the same firm also makes the Brown & Sharpe No. 1 universal cylindrical grinder.

Bullard Machine Tool Co., Bridgeport, Conn.; while

the Deutsche Niles has made a vertical turret lathe along the Bullard lines, this competition seems to have died away as well as that of Sondermann & Stier, A. G. Chemnitz.

Cincinnati Bickford Tool Co., Cincinnati, O.; plain radial drilling machines of the latest Bickford type are built in quantities by Zimmerman-Werke, A. G., Chemnitz; and the smaller sizes of radial, 3 and 4 feet, are built by several firms in smaller lots. Upright drills of good design and workmanship are built by Gebr. Reinhold, Gera, as a specialty, and also by a number of other firms.

Cincinnati Milling Machine Co., Cincinnati, O.; No. 1 tool grinder made by Fritz Werner, A. G. Berlin; also Collet & Engelhard, Offenbach, A. M; Schuchardt & Schutte, Berlin; while A. H. Schutte, Koln-Deutz, makes the No. 1½ size.

Cleveland Automatic Machine Co., Cleveland; automatics built by Schubert & Salzer, A. G. Chemnitz; Gildemeister & Co., Bielefend; A. H. Schutte, Koln-Deutz; and Leipziger Werkzeug-Maschinenfabrik, A. G., Leipzig.

Fellows Gear Shaper Co., Springfield, Vt.; a machine very similar in working principle, using the same tools, is built by Max Rober & Co., G. m. b. H., Chemnitz; built in larger sizes.

Fitchburg Machine Works, Fitchburg, Mass.; automatic lathe made by Gildemeister & Co., Bielefeld; and by Heidenreich & Harbeck, Hamburg.

Gould & Eberhardt, Newark, N. J.; shapers with the same characteristic details are made by several firms; the Samsonwerk, Berlin, have a new design, "with very small openings in frame," brake, splash lubrication, etc., with some details patented.

Higley Machine Co., South Norwalk, Conn.; saws made by Ernst Krause & Co., Vienna, Otto Doring, Berlin; Irmischer & Co., Saalfeld, a. S.

International Machine Tool Co., Indianapolis; Libby turret lathe (geared head) made by Zimmermann-Werke, Chemnitz.

Jones & Lamson Machine Co., Springfield, Vt.; turret lathe advertised by C. G. Haubold, Jr. 1, G. m. b. H. Chemnitz; and F. A. Scheu, G. m. b. H., Berlin.

Landis Tool Co., Waynesboro, Pa.; grinding machines made by Fritz Werner, A. G. Berlin-Marienfilde; Schubert & Salzer, Chemnitz; A. H. Schutte, Koln-Deutz; Schuchardt & Schutte, Berlin, and several others.

J. N. Lapointe Co., New London, Conn.; broaching machines made by Dolze & Slotta, Coswig, Saxony.

R. K. LeBlond Machine Tool Co., Cincinnati, O.; tool grinder made by Zimmermann-Werke, Chemnitz, in large lots.

Mitts & Merrill, Saginaw, Mich.; keyseater made by Elbe-Werke, Dresden; and Mammutwerke, Nurnberg.

National Acme Co., Cleveland; multiple-spindle automatic machines made by A. H. Schutte, Koln-Deutz; Gildemeister & Co., A. G., Bielefeld; Leipziger Werkzeug-Maschinenfabrik, A. G., Leipzig; the single-spindle Gridley automatic machine is made by Heidenreich & Harbeck, Hamburg; Gebr. Bohringer, Goppingen; Hasse & Wrede, Berlin; de Fries & Cie., A. G., Dusseldorf.

New Britain Machine Co., New Britain, Conn.; automatic machines made by Gildemeister & Co., A. G., Bielefeld.

Norton Co., Worcester, Mass.; Ludwig Loewe & Co., Berlin, is licensed to make Norton grinding machines.

Potter & Johnston Machine Co., Pawtucket, R. I.; this type of machine made by Herm. Schroers, Crefeld; deFries & Cie., A. G., Dusseldorf; Magdeburger Werkzeugmasdhinen-Fabrik, Magdebrug; Leipzger Werkzeug-Maschinenfabrik, A. G., Leipzig; Zimmermann-Werke, Chemnitz.

Builds Tools of Many Types

Among the leading German manufacturers of machine tools should be included Schuchardt & Schutte and Alfred H. Schutte. The former firm has its own factories and also controls the output of several others, making Blanchard and Landis type grinding machines; Cincinnati type tool grinders; turret lathes up to 2⅜-inch size; medium-sized milling machines; lathes; drilling machines; engraving machines; woodworking machines; and special machines for various types of manufacture; measuring instruments and tools; several types of small tools; grinding wheels; furnaces, etc.

Alfred H. Schutte has four factories, at Cologne-Deutz, Cologne-Ehrenfeld, Berlin-Reptow and Siegen-Marienborn. At Mr. Schutte's Cologne works, which are modern in every respect and employ 600 workmen, I saw the new Schutte four-spindle automatic. This machine has a single pulley drive and geared head, a capacity for bars up to two inches in diameter, and is provided with all the means for rapid and accurate production found on various types of American multiple-spindle automatic machines, including spindles mounted in adjustable bearing boxes with end thrusts taken by ball bearings, an auxiliary tool head, a special arrangement for rapid drilling and ample provision for lubricating oil for the cutting tools. The price is M. 27,500. Nearly all the German machine tool builders made money during the war. Some made large fortunes, but these now find them diminishing rapidly through heavy taxation, increased costs and governmental requirements in regard to wage payments to men not employed. The decline in earnings began with many firms before the war closed and the earnings of Ludwig Loewe & Co., probably are typical of many. This company's net profits and dividends in 1915 totaled M. 4,338,000; in 1916, M. 3,773,000; 1917, M. 4,485,000, and in 1918, M. 2,584,000. It employed 4000 workers during the war, many of whom were women but now about 2500 workmen are engaged and a few women. Its new building, begun in 1914, is not yet fully equipped, about half of it being devoted to the manufacture of milling machines. Dr. Waldschmidt still is managing director, Mr. Bechstein occupying his former position, and Mr. Huhn being in charge of the mechanical department.

In 1917-18 the Siemens Works made a clear profit of M. 14,000,000; but as the increase in wages this year already amounts to M. 70,000,000, it is evident that the showing for 1919 will be quite different.

It is reported that the Krupps Works does not intend to take up the manufacture of machine tools, but is selling those in its equipment which it does not need. It also is stated that the manufacture of textile machinery, typewriters, calipers, gages, and measuring instruments is being considered.

Since virtually no American tools have been coming into Germany for three years, of course, no American machine tool dealers now are in Germany. Even those who believe in American tools and would prefer to handle them, have been obliged to sell German, Swiss and Swedish products. The firm of Heinrich Dreyer has been liquidated and its fine show room now is occupied by Zimmerman-Werke of Chemnitz. Thielicke & Co., formerly in Charlottenburg, have their salesroom and offices at Kaiser Wilhelmstrasse 2, just across from Dryer's old location. Both Thielicke brothers were in the army, but came through with slight wounds. Schuchardt & Schutte are in the same location in Spandauer strasse. Oscar Burghardt, formerly manager of the Petrograd branch makes his headquarters here. Ernst Muller, formerly manager of the New York office, still is at Berlin in the same location as in 1914. Victor Giraud still is manager of the business.

German Dealers Resume Activity

Alfred H. Schutte has moved his Berlin wareroom from its former location in Alt-Moabit to Kroner strasse, 52, near the business section. Adolph Siems is still manager. E. Sonnenthal Jr. has moved to Ross strasse, 22. In addition to an extensive dealer's business, this firm has taken up the manufacture of lathes. Ernst Krouse of Vienna has opened a wareroom at Friedrich strasse, 123, principally for the sale of the product of his Vienna factory. He recently has been employing 400 hands in his Vienna factory, making lathes, drilling machines, Higley saws, planers and shapers and turret lathes. Mr. Krause recently bought a planer plant at Cologne, which he will

(*Concluded on page* 1180)

American Ideas Copied

GERMAN designers have made few changes in machine tools and few new machines have been brought out. On account of the tendency to copy American machines or to use their new points, manufacturers are cautioned about accepting first orders for such machines. Before the war, the German Machine Tool Makers' association had 72 members. The membership now totals about 320. The members apparently work together for much the same objects that are before the members of the American organization, except that the German manufacturers are free to regulate prices to any extent they choose. The members of the German association employed about 70,000 men and a large number of women in 1917 while in 1918-19, about 60,000 men and fewer women were engaged. Makers of engine lathes in the organization number 90; vertical boring mills, 13; cutting off machines, 20; horizontal boring mills, 27; gear cutting machines, 19; turret lathes, screw machines and automatics, 37; milling machines, 83; drilling machines, 43; planers, slotters and shapers, 44; and grinding machines, 40.—Mr. Luchars.

Schneider's—An Industrial Pillar

Great French Iron and Steel Works, Founded by Cabinet Member in Reign of Napoleon III, Proves Giant of Strength in Liberty's Cause—Glimpse of Organization Whose Head is Visiting the United States

BY FRANCIS MILTOUN
French Correspondent of The Iron Trade Review

THE visit to the United States of Charles Eugene Schneider, head of Schneider & Co., Creusot, France, as chairman of the French delegation to the international trade conference in Atlantic City last week, serves to recall the notable service rendered by the company's great iron and steel plants to the cause of liberty. Monsieur Schneider, who is president of the Iron and Steel institute, an office to which he was elected at the first meeting of the institute in London after the war, in recognition of his work in behalf of the allies as well as his ability in metallurgical and engineering fields, also has received honors in the United States. This year he received the gold medal of the American Mining and Metallurgical society for distinguished service. In this article, THE IRON TRADE REVIEW'S *French correspondent gives a brief history of the Schneider establishment and the extent of its operations since its foundation, a summary which will serve to point out the importance of the work of the distinguished French industrial leader who is now touring this country.*

WHEN Charles Eugene Schneider the famous French ironmaster was elected president of the Iron and Steel institute, at its first after-the-war convention in London, popular opinion in regard to the versatility and broad-mindedness of this chief personage of the French metallurgical industry was confirmed.

Schneider's has been a name to conjure with in French metallurgy for over a century, the establishment having been founded by Joseph Engene Schneider, an ironmaster of Bazeilles, who was minister of the legislative corps in the reign of Napoleon III, and a member of the emperor's privy council.

The business developed rapidly and by the middle of the nineteenth century it passed to the son of the founder, Henri Schneider (1840-1898). The present head, the son of Henri, became a partner on his majority and became the ruling power in the company on the death of his father, whom he also succeeded as a member of the French parliament.

Plant Well Equipped as War Started

A century of labor found the Schneider plant fully equipped for the responsible part they were to play in the great war. The chief handicap at the beginning of its labors in behalf of *la patrie* was the fact that the enemy occupied the Briey basin, from which it obtained a large part of its raw material. Finding it impossible to receive high-phosphorus iron from its Briey plants the company increased its facilities at the Creusot works in order to produce bessemer steel, and by the middle of 1915 it had succeeded in experiments which enabled it to produce shells of bessemer steel in a most satisfactory manner. This then became the chief production at Creusot.

At the end of 1915 another large steel plant was erected at Le Breuil, nearby, originally intended to contain four open-hearth furnaces. The first unit began pouring in August, 1916. Finally six furnaces, each of 60 tons capacity were in operation and later two 30-ton furnaces were installed. By the end of 1917 more than 1000 tons of ingots were produced each day.

Because of the increased demand for pig iron, a new blast furnace was fired at Creusot in 1915 and another in 1916. By the end of 1917 production of guns and ammunition at Creusot had increased 1000 per cent over what it was at the end of the first year of the war.

At the beginning of the war, Schneider put all his formulas and processes at the disposal of the French government. These were particularly valuable in the production of shell steel. The company assisted other plants which never before had to contend with such problems as were thrust upon them, and loaned its technicians to enable them to increase production with the least possible delay.

The company at this time acquired a working interest in the Société des Hauts Fourneaux et Acieries de Caen, whose plant had been idle since the opening of hostilities, and the subsidiary Schneider company, the Société Normande de Metallurgie, obtained the necessary authority for completing and bringing into production the Caen plant.

A mission of the Schneider engineers visited the United States with a view to having produced shells in accordance with Schneider specifications, a task successfully undertaken by the United States Steel Corp., and the Lackawanna Steel Co.

Recently it was announced that the company has acquired a controlling interest in the famous Skoda Works, at Pilsen, employing 30,000 workmen. This plant, formerly under Austrian control, but now under the Czecho-Slav government, has made an agreement with the Creusot firm of Schneider's, and the capital of 72,000,000 crowns will be increased immediately to 144,000,000. The new council of administration will include three French representatives and six Czecho-Slav members. The new president is M. Simoneck, a Czecho-Slav, and the vice president, Monsieur Schneider. The other French directors are Col. Henri Viel, and Mons. Victor Champigneul, engineer.

The Creusot works proper consist of a colliery, blast furnaces, by-product coke ovens, open hearths and mills capable of converting the entire production of ingots into armor plates, sheets and shapes. They also include foundries for steel, iron, and nonferrous metals, shops for building turbines, locomotives and ordnance.

Plant Includes Coke Ovens

The Henri-Paul plant, named in honor of the eldest son of Monsieur Schneider, is at Montchanin-les-Mines in the department of the Saône et Loire, and includes a bronze foundry, now undergoing considerable development, and a battery of by-product coke ovens.

The Breuil works, near Creusot, is a high efficiency steel plant, with 60-ton ton 30-ton open-hearth furnaces in operation.

The Havre, Harfleur et Hoc plant includes engineering shops for the production of marine and diesel engines and gun-proving shops and ranges.

The Chalon-sur-Saône works specialize on the building of steel bridges and small naval craft, submarines, torpedo boats, etc. The great Alexander bridge at Paris, one of the products of this plant, is considered in France as the

most artistic and durable of all steel bridges.

The Champagne-sur-Seine works specialize in electrical machinery. At La Londe les Maures, on the Mediterranean in southern France, is a torpedo plant, producing small electric motors. At Paris are shops for producing gunsights and similar equipment, and at Bordeaux is a plant producing cartridges, and manufactures made of light alloys. The company at Creusot is directly interested in coal mines at Decize in the department of the Nièvre, the Chaillac iron mines in the department of the Indre, and the Droitaumont iron mines in the department of Meurthe-et-Moselle.

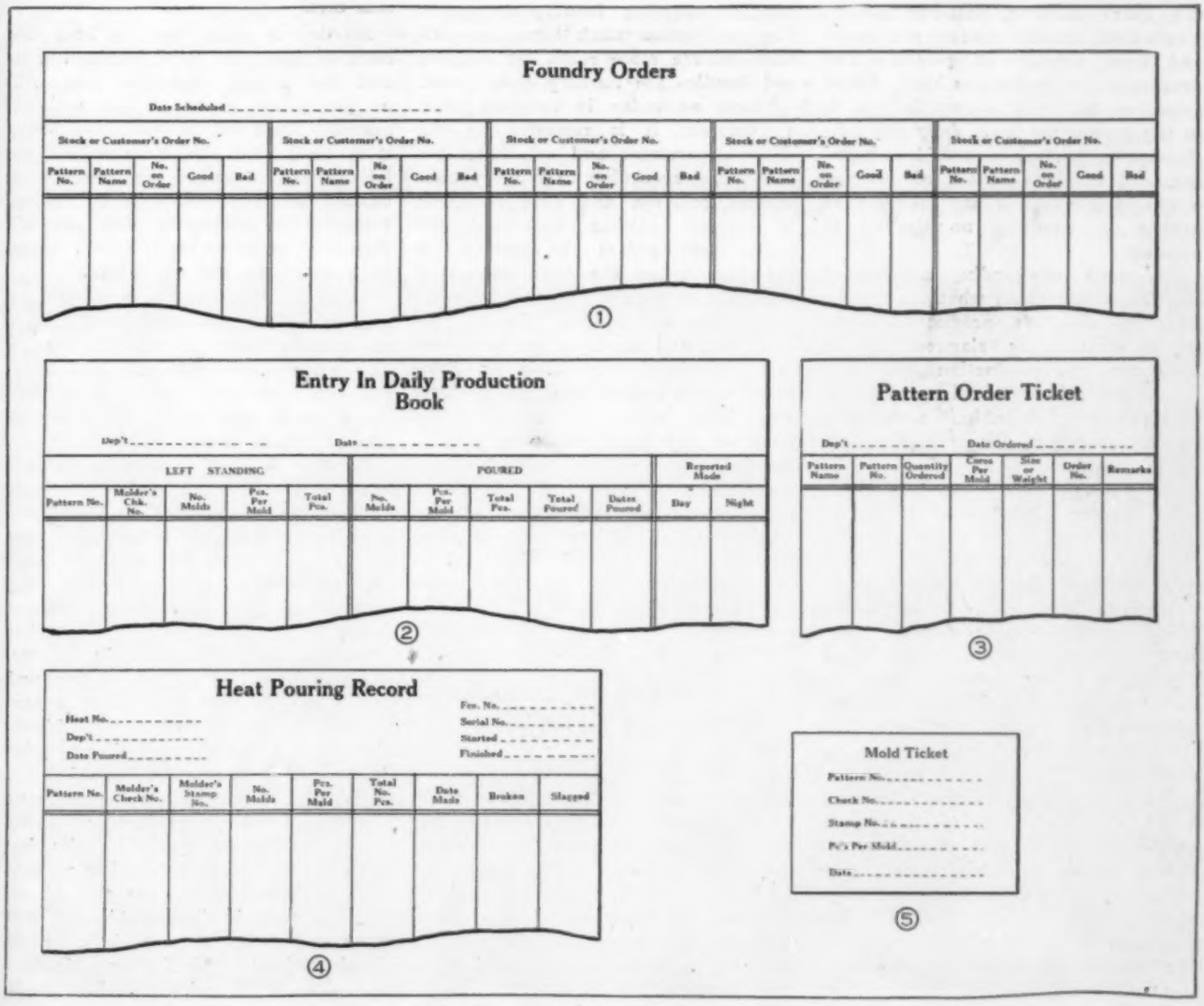
The following figures give an indication of the size of the parent concern: Area of ground owned, 17,300 acres; horsepower, 200,000; machine tools in use, 5000; locomotives, 100; freight cars, 6500; track length, 200 miles.

Handling Costs in a Steel Foundry

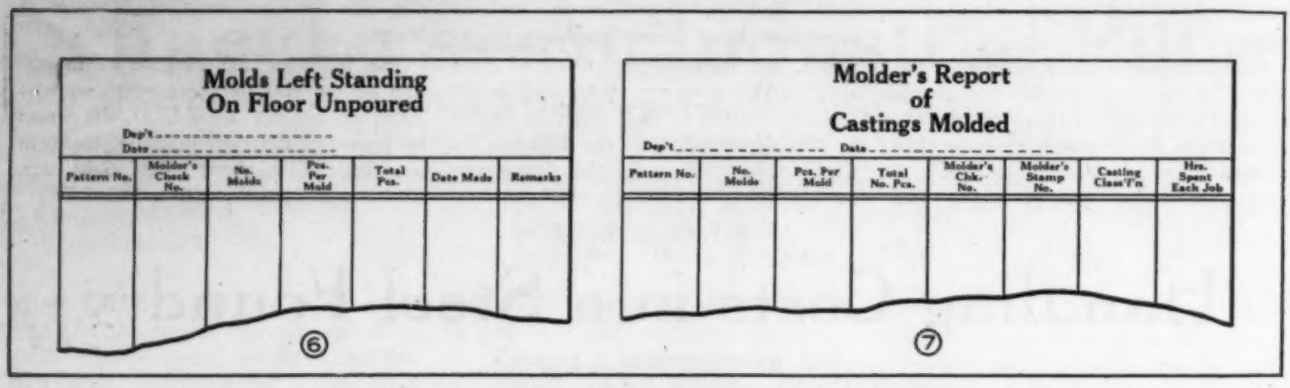
BY CLIFFORD E. LYNN

PROBABLY the most essential step in securing accurate production records in a foundry is to have a check on the molder's daily time distribution slips. If the timekeeper is required to visit each molder personally at the close of the day to ascertain what has been produced, a check of the molder's verbal statement should be made. The best method of accomplishing this task without arousing the molder's antagonism is to have the foundry production clerk secure daily from each molder a statement of what he intends making, securing check number, pattern number, number of molds or piles, stamp number and date. He then places this information on a ticket shown in Fig. 5 which he passes to the molder, who places the tickets on each pile which may constitute one or more molds, before the heat is poured.

The production clerk precedes the ladles, as the heat is being poured, collecting all tickets from molds or piles, which the ladleman informs him he intends pouring. From these tickets he compies a daily-pouring record showing the number of the heat, date made, pattern number,



FIGS. 1 TO 6—VARIOUS FORMS USED IN FOUNDRY COST KEEPING



FIGS. 6 AND 7—TWO FORMS USED IN MAKING OUT FOUNDRY REPORTS

number of molds, pieces per mold, total number of pieces, stamp number and date of pouring. The form used for this record is shown in Fig. 4. At the end of each day he should visit each mold or pile, placing tickets on all left standing unpoured.

From a count of these molds or piles, a left-standing-on-the-floor record, shown in Fig. 6, should be made, showing date produced, molder's check number, pattern number, number of molds, pieces per mold and total number of pieces. The timekeeper or production clerk should enter on the form, shown in Fig. 2, in the production book daily the left-standing-on-the-floor record, heat pouring, and molder's report of castings produced, showing if any molds were broken in handling or slagged in pouring.

The daily left-standing and poured records should equal what the molder daily reports, as produced, minus molds broken or slagged. If it does not, the production clerk and timekeeper should investigate and correct any error made, before the daily production report, shown in Fig. 7, is made out and sent to the cost department.

The correct production is posted daily on time cards made out for the pay period and ruled to show date produced, pattern number, number of castings, molder's check and stamp numbers, molds broken, castings rejected by inspector, piece and day work, hours and rates per 100 pieces or hour. The productive and nonproductive hours are classified separately, showing hours spent on each job.

Classifications of castings, dividing bench, floor and machine, made with subdivisions are also recorded for benefit of the cost department. The scrap or open-hearth furnace charge is weighed, as is the finished casting, after it has been routed through the sand-blast department and inspected.

At the end of each month, which also is the end of the latter half pay period, an inventory of all molds left standing, poured and unpoured, or castings shaken out is taken by the production and time clerk, and marked old pay, so that the old and new pay are properly divided. It also is the duty of the timekeeper to record the time taken from clock cards, handle all transfers, employment slips, discharges and other matters effecting foundry employes. The production clerk issues requisitions on the store room for supplies and handles the foundry order book.

When an order is received from a customer, it is recorded by the order department and scheduled for production according to foundry conditions, priority, and date shipment is desired. When scheduled the order clerk orders the pattern for the foundry on the form shown in Fig. 3 and tags it with a number. He orders the quantity wanted, the size, etc., and sends a list of orders thus scheduled for stock or shipment to the foundry production clerk. The latter enters it in his order book on the form shown in Fig. 1, deducts the castings molded daily, adds the inspector's daily report of castings scrapped which have to be made over, and records castings passed as good. When the total of good castings made equal the quantity order, the order is considered completed.

Germany a Future Tool Factor

(*Concluded from page* 1177)

use for manufacturing machine tools. F. G. Kretschmer at Frankfurt-on-the-Main has been handling German tools during the war and has a large stock on hand. Both Mr. Koyemann and his associate, Mr. Huttner of Dusseldorf, were in the army during the most of the war, and are now re-establishing their business.

There are said to be some 60 automobile factories in Germany, but not more than a dozen are active, and only a few of those have been able to get sufficient material to turn out a normal product. Before the war few of these manufacturers produced cars as we do in the United States. It is said there were 190 different kinds of cars made. The financial outlook in Germany does not warrant large investments in the manufacture of either pleasure of business cars.

No definite policy has yet been decided on about the tariff, although it is said that a high protective duty will be placed on imports. The national assembly being only a provisional body, it is likely that this question will be left to its successor, but there is a marked tendency among those having authority, to arbitrarily shut out all American machine tools, except those types which are not made here.

There has been no change in the German patent law since 1909; and American manufacturers are advised to patent any improvements that are patentable, not only for their protection in Germany, but in other continental countries where German tools may be sold.

In what remains of Austria, the machine tool industry is on an uncertain footing, due to unsettled conditions and a debased currency. In Hungary, the new government is too young for anyone to venture an opinion about the future, except that any government must be an improvement over what Hungary has had lately. In Prague, business is said to be encouraging, and the Czecho-Slovak government apparently is growing in strength. Machinery dealers in Berlin also say they are doing a good business with Finland.

Everyone whom I saw in Germany was friendly and there is no animosity against Americans as individuals; but there is a strong feeling against us as a nation. The Germans say that if we had not come in they would have won the war, and they are not of the readily forgiving kind. This feeling will affect the sale of American machine tools and other products in the future.

Fig. 1—Rail testing apparatus in laboratory of United States bureau of standards, Washington

Testing Steel by Magnetic Analysis

BY R. L. SANFORD

MAGNETIC analysis may be defined as the utilization of the magnetic methods for the study of the internal structure and mechanical condition of magnetic materials and in particular of iron and steel. It may be used to detect structural changes on heating or cooling or as an indication of mechanical properties. The results of magnetic analysis are to be interpreted in the light of the best available knowledge of the correlation between the magnetic and other properties of materials.

From a paper presented at the sixteenth general meeting of the American Iron and Steel Institute, New York, Oct. 24. The author, R. L. Sanford, is associate physicist, United States bureau of standards, Washington, D. C.

Many physical and chemical methods for testing steel and steel products destroy the sample or render it unfit for the use for which it was originally intended. This fact has made necessary our present methods of vicarious testing. It is plainly evident, therefore, that any satisfactory nondestructive method which makes possible the comparison of each individual piece with one whose performance has been carefully determined and which thus serves as a standard of quality will have great commercial value.

The mechanical properties of steel are functions of its chemical composition and of its micro-structure and mechanical condition. The micro-structure and mechanical condition, such as internal strain, etc., are determined by the thermal history and the amount and kind of mechanical work that has been done on the piece. The magnetic properties of steel are likewise functions of the same variables and any change produced in one set of properties is accompanied by a corresponding, though not necessarily proportional, change in the other.

Fig. 3 shows graphically the relations between the quantities measured during the course of a complete magnetic test. If a magnetically neutral or demagnetized piece of steel is subjected to an increasing magnetizing force, the resulting induction

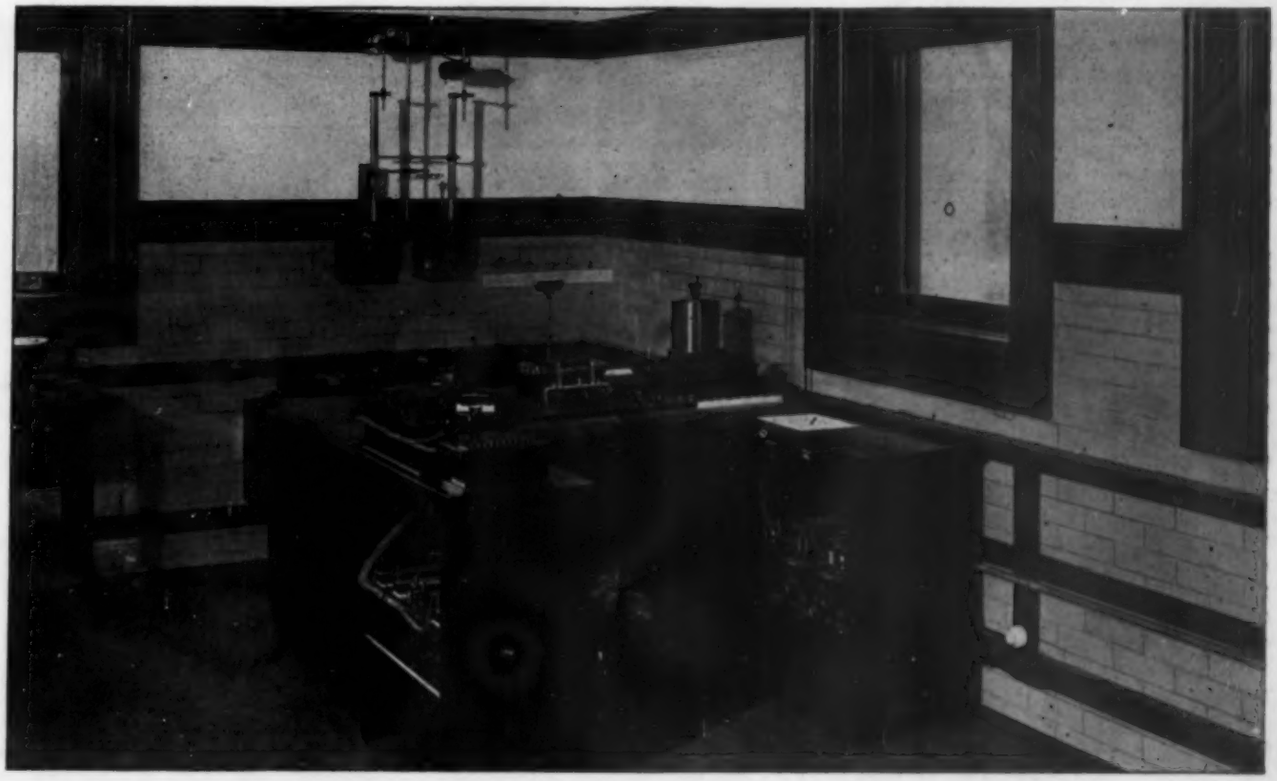


FIG. 2—PERMEAMETER APPARATUS USED IN CONNECTION WITH THE MAGNETIC ANALYSIS OF STEEL

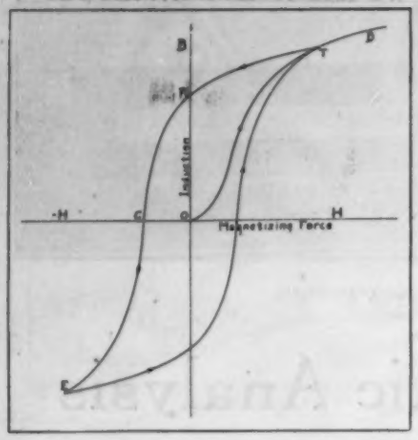


FIG. 3—SHOWING INDUCTION AND HYSTERESIS CURVES FOR STEEL

is indicated by the curve *OTD*. If the magnetizing force should only be brought up to the point *T* and afterward reduced, and then increased to the same value in the reverse direction, the curve *TRCE* is traced where values at the left of the axis represent magnetizing forces in the reverse direction. If the magnetizing force is again reversed, a closed loop is traced as shown. This loop is called the hysteresis loop and its area is proportional to the energy required to take the steel through a complete magnetic cycle. The value of induction corresponding to the point *R* is known as the residual induction and the value of reversed magnetizing force required to reduce the induction to zero, represented by the point *C*, is called the coercive force. The point *T* representing the maximum value of magnetizing force and induction for a given hysteresis loop is called the tip of the loop. The ratio of magnetic induction to the corresponding magnetizing force at any point on the curve *OTD* is called the magnetic permeability.

It is too long a story to present at this time in any detail the results of many experiments which have shown the existence of a close connection between the magnetic properties of steel and the factors determining its mechanical properties. We may consider three cases which are illustrative of the effect on the magnetic properties of chemical composition, hardening and tempering.

Fig. 6 shows the variation in permeability of annealed carbon steel with various carbon contents. It will be noted that the permeability varies through a rather wide range as the carbon content varies from 0.11 per cent to 1.8 per cent, decreasing as the percentage of carbon is increased.

The curves of Fig. 8 show the effect on the coercive force of drawing or reheating a 1 per cent carbon steel after quenching. Note the clear evidence of the cementite transformation in the case of the water-quenched steel which took place between 200 degrees and 300 degrees Cent. The transformation evidently took place during the quenching when oil was used as the quenching medium, due to the slower rate of cooling through the critical range.

While the evidence already at hand is sufficient to demonstrate that there is a very strict correspondence between the magnetic and mechanical properties of steel, these relationships are so complex, that up to the present time no definite laws have been worked out. Indeed it may prove extremely difficult, if not impossible, to completely define in terms of the magnetic properties of a substance all of its other physical properties. In spite of this apparently discouraging fact, we need not wait for the complete working out of all the correlations before applying magnetic analysis in a practical way.

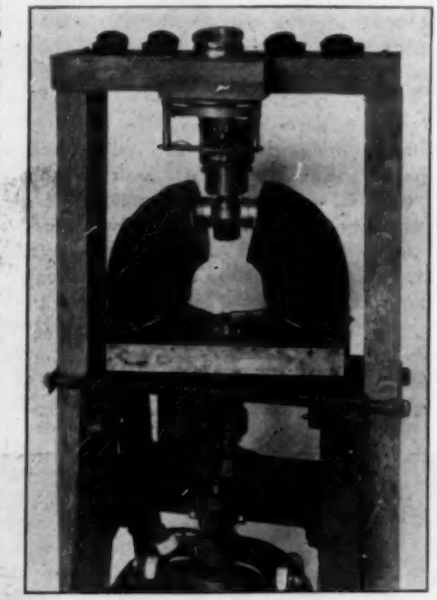


FIG. 4—EXPERIMENTAL APPARATUS FOR TESTING BALL BEARING RACES

The methods of magnetic analysis may be employed either by the investigator, as an aid to the solution of theoretical problems such as those arising in the study of the phenomena involved in the hardening of steel, or by the testing engineer, as a nondestructive method of test to supplement the methods already in use.

A laboratory such as that of the United States bureau of standards is admirably adapted to the study of this subject from the theoretical standpoint and the magnetic laboratory of the bureau is at present carrying on investigations of this nature.

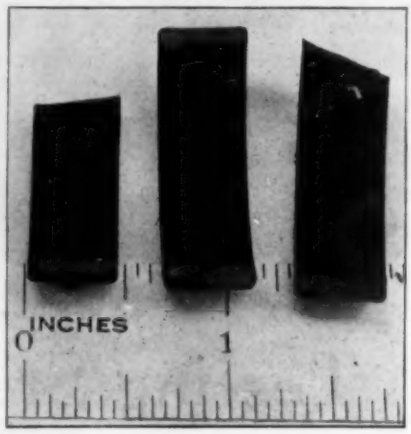


FIG. 5—CRACKS IN BALL BEARING RACES DETECTED BY MAGNETIC ANALYSIS

This work is being done in co-operation with other divisions of the bureau and in particular with the division of metallurgy. This work is not yet sufficiently far advanced to present definite results, but they are very promising and indicate that the method may be expected to yield very valuable data which will serve not only to advance our theoretical knowledge, but also to provide a foundation on which practical applications may be based.

Fig. 2 shows a corner of the magnetic laboratory and the apparatus used for making standard tests of the magnetic properties of specimens of iron or steel.

For practical purposes, magnetic

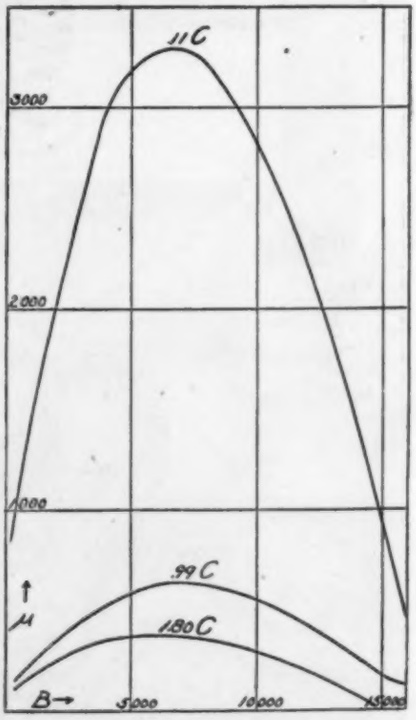


FIG. 6—VARIATION OF PERMEABILITY WITH INDUCTION FOR STEELS OF DIFFERENT CARBON CONTENTS

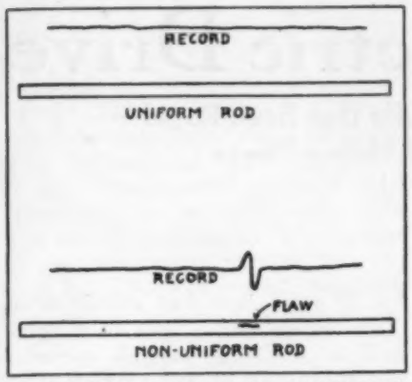


FIG. 7—TYPE OF PHOTOGRAPHIC RECORD SHOWING DEGREE OF MAGNETIC UNIFORMITY OF STEEL BARS

analysis has as its ultimate object the development of methods and instruments which can be used in the shop for the purpose of comparing the factory product with specimens which have been selected as standards of quality. At the present stage of development, each application must first be the subject of an individual investigation. The properties of the material must be studied, the magnetic criteria for quality must be determined upon and apparatus must be built for making the magnetic measurements quickly and accurately under shop conditions. After these steps have been completed, the final step is tried under actual service conditions to demonstrate that the method is sufficiently rapid, accurate and reliable to warrant its commercial use.

The magnetic laboratory has developed a method for determining the degree of magnetic uniformity along the length of a specimen of substantially uniform cross section. This method has been adapted to the study of steel rails. Part of the apparatus for testing rails is shown in Fig. 1. The test consists of surrounding the rail with a magnetizing solenoid which is run along the rail. A sensitive electrical instrument which is connected to a test coil carried with the solenoid indicates any change in magnetic permeability of the specimen as the coil moves along. The type of record obtained by photographic means is indicated in Fig. 7.

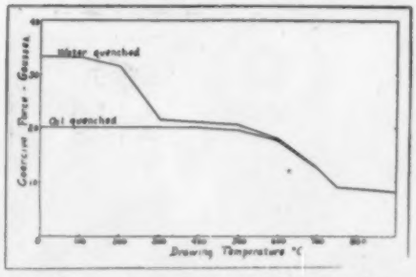


FIG. 8—EFFECT OF COERCIVE FORCE OF DRAWING 1.0 PER CENT CARBON STEEL AFTER QUENCHING

The greatest difficulty in this line of investigation lies in the interpretation of the results. This is due to the fact that there are many causes that may produce magnetic inhomogeneity, such as chemical segregation, strains, and flaws, and it is difficult to differentiate between them. The conclusions so far warranted are that a bar which is magnetically uniform along its length is also mechanically uniform, that a bar which is mechanically nonuniform along its length is also magnetically nonuniform and this nonuniformity will be surely indicated by the test; and finally that bars which are magnetically nonuniform may or may not be seriously defective from the mechanical point of view.

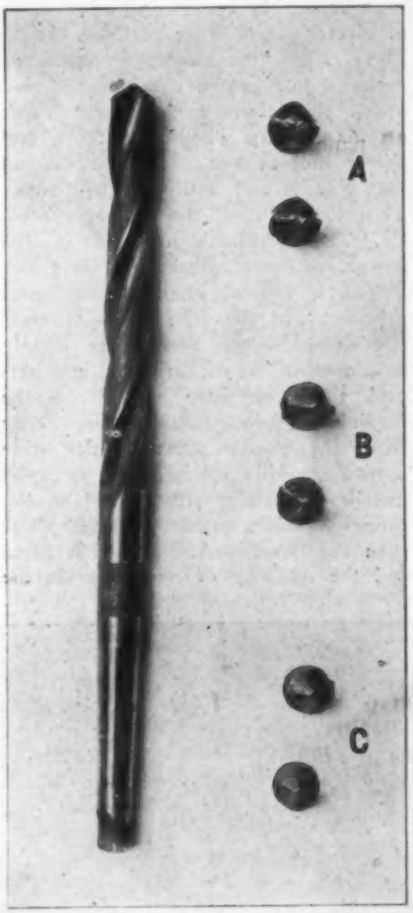


FIG. 9—RESULTS OF SERVICE TESTS ON TWIST DRILLS

This last conclusion points out the necessity for further investigation which is being carried out in cooperation with the ordnance department of the United States army.

A method is in process of development for the testing of ball bearing races. The work is not yet complete but it has been demonstrated that the apparatus is capable of detecting flaws, such as hardening cracks in the rings.

The apparatus used is shown in Fig. 4. The ring is mounted on a table free to rotate and magnetized between the poles of an electromagnet which also rotates. The rotation of the ring is opposed by a spiral spring. By means of a pointer and scale the torque exerted on the ring by reason of the rotation of the electromagnet can be measured. This torque is proportional to the energy required to carry the direction of magnetization of the ring through one complete revolution. It seems probable that this value may be used as an index in testing the rings. If the needle jumps during the rotation a crack or soft spot is indicated. The cracks shown in Fig. 5 were detected in this manner.

FIG. 10—EXPERIMENTAL APPARATUS FOR TESTING TWIST DRILLS

Fig. 10 shows apparatus used in preliminary experiments on twist drills. The drills shown in Fig. 9 were first given a magnetic examination and then drills *A* and *B* were subjected to identical service tests. The coercive forces for these drills were in the ratio of 3 to 2, the higher value indicating the better drill.

The work already done has furnished sufficient evidence of a very strict correspondence between the magnetic and mechanical properties of steel to warrant the conclusion that magnetic methods may be used to advantage in fundamental investigation and for nondestructive testing of steel products which obviously will have very great commercial value.

The future development of magnetic analysis must progress along the two lines of fundamental research and practical application since the proper interpretation of the results requires a full and complete knowledge of the existing relationships and this knowledge will have practical utility only as it is actually applied to the study and control of the structure of steel and the inspection of finished products.

Outlines Status of Electric Drive

Development of Electrically Driven Reversing Rolling Mills Has Been Rapid—Reversing Motor Has Been Used on All Types of Mills—Power Distribution is Economical and Flexible

BY WILFRED SYKES

WE ARE becoming so accustomed to the use of electric machinery in our daily life that sometimes the significance of the change from past practice is not appreciated. I believe this is true to some extent in regard to the electrically driven reversing rolling mill which has been quite extensively used in the last few years, and it is the object of this paper to review briefly the factors that led up to its development and to summarize the present state of the art.

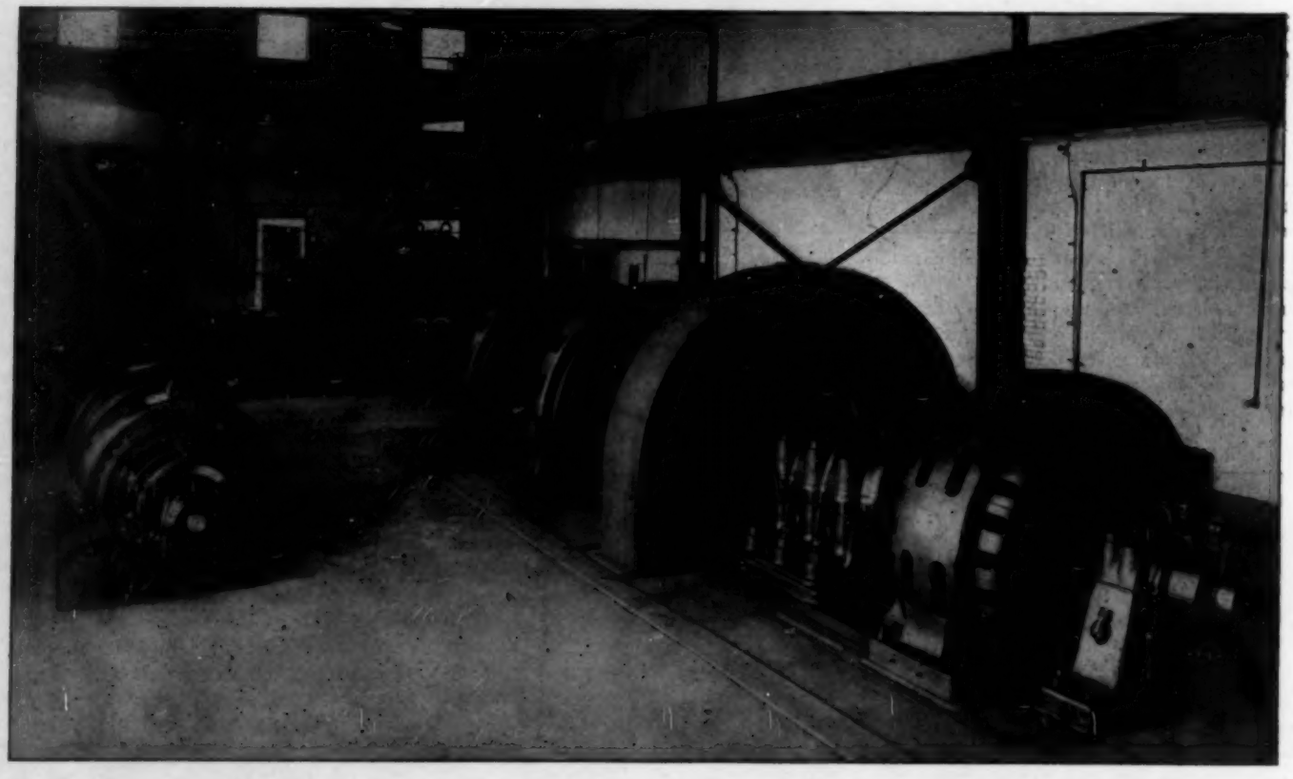
The idea to use electric motors for driving rolling mills was first exploited in Europe where a number of small equipments were installed, beginning about 20 years ago. These were all used for driving mills running in one direction, and the machines were of the types already developed for other purposes. The ease with which the extension of the plant could be cared for, and the freedom from restrictions as to distance from the boilers was quickly appreciated, even before the economical advantages of electrification were realized. About 15 years ago, the number of machines installed had grown considerably, and about this time, a start was made in this country when two 1500-horsepower motors were built for driving the No. 3 rail mill at the Edgar Thomson plant of the Carnegie Steel Co. The problems involved in the design of such plants as Gary required a radical change from past practice, and the advantages of electric drive having been more clearly developed in the meantime, it was natural that electricity should be the medium for transmitting the energy from the power plant to the wide spreading mills which could then be distributed solely with regard to the proper handling of the material. Since then the development has been rapid and the majority of new mills in the last 10 years have had electric drive.

Production carries with it all questions of reliability, ease of operation and the fitting of the characteristics of the drive to the requirements of the mill. Economy covers all items of cost such as fixed charges, power cost, labor, maintenance, stores, etc., so that an answer to these two questions satisfies the usual mill man.

There is one other factor not quite so tangible, but of the greatest importance in the development of a plant, and that is the question of layout. With the use of electricity, we suffer no practical restrictions so that our plants may be laid out with regard only to the facility for transportation of materials and although this does not show itself directly in costs, when the plant as a whole is taken and compared with others, very gratifying results are obtained.

The reversing motor has been used for all types of reversing mills and to date has not found its limitations. Blooming mills, billet mills, plate

From a paper presented at the sixteenth general meeting of the American Iron and Steel Institute, New York, Oct. 24. The author, Wilfred Sykes, is with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.



REVERSING MOTOR AND FLYWHEEL MOTOR GENERATOR SET IN PLANT OF STEEL CO. OF CANADA, HAMILTON, ONT.

mills and structural mills have all been electrified with success. The first installation put in operation 12 years ago at the South works of the Illinois Steel Co. drove a 2-high universal plate mill, and I feel that it is only proper to pay a tribute to the foresight and courage of those responsible for the decision to make this initial experiment. It remained for steelmakers in Canada to carry out the first successful blooming mill drive, and credit is due Robert Hobson, of the Steel Co. of Canada, for taking the responsibility of tying up his new plant to the comparatively untried electric drive.

The principal part of an electrical reversing drive is, of course, the motor connected to the mill. These motors are direct current machines and differ little in general characteristics from those with which we have been long familiar. There are, however, many special features that play a most important part and that spell the difference between success and failure. Of first consideration must be the mechanical construction and this must be beyond question. We must make a closer study of the details of construction than is usual to insure there can be no relative movement of parts under the severe shocks that the motor has to stand, and prudence requires that all parts be so strong that in case something must break about the mill, it will not be the motor. Together with this, we must keep our design balanced so that the weights of our moving parts are not excessive, as an appreciable amount of energy is required to accelerate and retard the motor itself.

The motor is not supplied with energy direct from the power plant, but through a so-called flywheel motor generator set. The function of this set is to provide means for controlling the speed and direction of rotation of the motor, and of equalizing the load on the power plant. It would be, of course, very difficult to build any type of controlling equipment that would handle the large current involved in motors of this type, as will be readily appreciated when we think of the flashing and noise made by the controllers for the motors driving the tables, screw down, etc., which seldom exceed 100 horsepower, whereas our main motor may carry loads 100 times as great. The speed of the motor is proportional to the voltage impressed on it, and its direction of rotation depends on the way the current flows through it. By having a special generator to supply the motor, we can through the excitation of this generator, vary the voltage and the direction of the main current, and we need handle only about one-half of 1 per cent of the current in the motor. This is, of course, easily done and the control of our 10,000 to 20,000 horsepower motors is actually better than the control of the table motors.

The second function of our flywheel set is to prevent the terrific peak loads from the mill from being thrown on the power plant. If this were not done, it would be necessary to have large generating capacity running at very low average load to carry the mill. Fortunately, we can equalize the load to a great extent by a properly controlled flywheel which will give up energy during periods of great demand and absorb it during the intervals. For this reason, suitable flywheels are connected to the generators supplying power to the reversing motor and through the aid of suitable controlling apparatus, they are utilized so that the load on the power plant is only about one-fourth of the peaks on the main motor.

For driving the generator and flywheel, some kind of motor is required, and the type is dependent on the power system. This motor is only large enough to carry the average load and is not concerned with the peaks of the mill motor. The remainder of the equipment is for the purpose of controlling these functions and providing means for measuring and recording the power used. The starting and the control of the speed of the motor driving the set is done by the slip regulator, which automatically slows down the flywheels during peak load, thus causing it to give up energy, and accelerates it during intervals, thereby absorbing energy.

In regard to production, it is sufficient to say that investigations we have made of records show that electric drive in all cases is able to hold its own with the best of past practice, and there is ample evidence to show that with the elimination of restrictions in the mill, better performance can be obtained.

No one questions that the most economical method of making any article is to specialize the plant, installing the best equipment and manufacturing in large quantities. With reasonable distribution costs, such an establishment will eventually supplant the isolated small manufacturer. The whole history of our industrial development bears this out. And so it is with power generation. For economy we must concentrate our power equipment so as to utilize the best that science provides us with. By using large units, the greatest economy is obtained, and the relative labor and other costs are reduced to a minimum. If we then connect to such a power generating station all our power consuming devices, we will find that the aggregate required is less than the sum of the loads on the individual consumers. It is the same as having a diversified market for our products, a dullness of one locality is compensated for by a demand from another, and in this way our average output is maintained approximately constant, which is obviously the most economical condition. If we had to support individual factories to supply all local demands, we would in the aggregate have a capacity out of proportion to our total output. Efficient distribution is the solution in the case of our manufactures, and with power electricity provides the economical means for transporting our power to the consuming devices. The ideal we must work to is to generate our power wholesale and distribute it efficiently. Electricity provides us with a means of using the most economical prime movers, and the consuming devices can be driven with machines that will transform our wholesale generated power to mechanical work with a loss of only a few per cent.

With the experience now available, it is beyond question that our power distribution in the future will be by means of electricity, and we should lay out our generating stations with units of such size and characteristics in relation to the ultimate requirements as to get the best economy, and with such a margin of capacity that the electrification of our plants can take place as opportunity offers, without having to consider each time we desire to add a motor whether the generating plant will not have to be extended. We can then modernize our mills as changes are required and ultimately convert our wasteful methods of power generation of the past to the best that we have at present knowledge of. Great force is given to this viewpoint with the rapid rise of fuel and labor costs, two of the principal factors in our power costs. It is wise in this respect to consider the possibilities of ultimately tying different generating stations together for the material benefit of those concerned. In this way, power may be interchanged at times to advantage and the stand by value of such interconnection reduces the amount of spare plant required with the consequent savings.

Making Ingots for Rolled Wheels

Practice of Using Multiple and Individual Ingots for Locomotive Tires and Rolled Wheels is Well Established in America—Choice of Two Depends Upon Local Manufacturing Conditions

BY LAWFORD H. FRY

ALTHOUGH the processes of manufacturing railroad tires and wheels differ in detail, both products require a ring of sound steel as their starting point. Table 1 shows the chemical specifications of steel wheels as adopted by the American Society for Testing Materials. Class *A* tires are usually used for the large diameter driving tires for passenger locomotives; class *B* tires for drivers for freight locomotives, for locomotive truck and tender wheels, and for car wheels; and class *C* for driving tires for switching service. The large majority of tires are made from acid open-hearth steel, while rolled wheels are made from both basic and acid open-hearth steel. In view of the exacting nature of the service clean dense steel is essential, but with care in the steel making good results can be obtained with acid or basic open-hearth, or with electric steel.

In manufacturing these products the first step is to select an ingot or a portion of an ingot of a weight to make the tire or wheel, and, after heating, to compress this in the direction of its longitudinal axis at the same time punching a hole through the center. The resultant piece, which is commonly known as a bloom, is generally similar for tires or wheels except that for wheels the hole is smaller in diameter and in some cases the hub is partly formed in this operation. In the succeeding operation the bloom is formed into a blank in which the shape of the finished product is roughly apparent. A subsequent rolling operation completes the manufacture of tire or wheel. As a necessary part of the manufacture of tires or rolled wheels, the central core of the ingot is punched out and discarded. This point is of importance in connection with the use of individual ingots.

Types of Ingots

Ingots for wheels or tires usually are classified as multiple ingots and individual ingots. The difference lies in the fact that the individual ingot is cast of a size to make a single tire or wheel, while a multiple ingot is sliced, at right angles to its long axis, into a number of blocks each of which is formed into a wheel or tire. This slicing was formerly done by heating the ingot and shearing under a press or hammer, but is now generally carried out cold on a slicing lathe with multiple tools.

Metallurgically considered, the two types of ingots are differentiated by the principles involved in the elimination of piping and segregation. Multiple ingots are designed to concentrate these defects in the upper quarter of the ingot which is discarded after slicing the lower portion into blocks. Individual ingots are designed to eliminate piping almost entirely, to reduce segregation to a minimum, and to place these defects so that they are completely removed by the punching operation in the first process of manufacture.

It should be noted that in one process of wheel manufacture the bloom is formed, not directly from an ingot, but from a bar 12 or 14 inches in diameter rolled from an ingot and sheared hot into slugs of the proper weight. The ingots used in this process are rectangular in cross section, measuring about 20 x 27 inches. Such ingots are related to the other ingots used for rolled bars, rather than to tire and wheel ingots proper.

Cross Section of Multiple Ingots

Multiple ingots usually have an eight or 12-sided cross section with concave sides. The dimensions of a series of 12-sided ingots used by one tire manufacturer are given in Table II. The mold has 12 slightly concave sides, and with a nominal diameter of 17 inches produces an ingot about 94 inches long, weighing about 64 pounds per inch of length. Ingots of this type are made with diameters of from 10 to 30 inches, according to the weight of piece to be made. It may be noted that wheel weights average about 950 pounds while tire weights may run from 300 to 2000 pounds. Both makers, whose practice is illustrated in Table I, use acid open-hearth steel, bottom pouring, and hot tops on the ingots. This is a bottom poured, flat sided, octagon ingot which has been sliced hot in blocks *A*, *B* and *C*, each of which will make one tire. The unlettered section is the discard necessary to do away with piping and segregation. The discard from the ingot amounts to approximately 20 per cent of the ingot weight. The amount of discard necessary can be reduced by using some forms of hot top by which the head of the ingot is kept hot and fluid until the greater part of the shrinkage in the body has taken place. The upper part of the ingots has been sectioned on the longitudinal axis. The ingots cast without hot top have a pipe extending throughout the upper 20 to 25 per cent of their length. Sometimes ingots have their upper portions protected from contact with the iron mold by a heat-insulating jacket, and, in addition, a layer of carbonaceous material was applied to the ingot top immediately after pouring. Piping has been eliminated and a discard of 10 per cent would be sufficient to remove all segregation and to leave only sound useable steel. In practice it is more convenient to keep the mold of uniform diameter and to insert a brick or sandhead to provide insulation, or to make up a sandhead in a cast-iron casing placed on the top of the mold.

While the use of multiple ingots is fairly well generalized, the use in America of the individual ingot for tires and wheels is confined at present to the Standard Steel Works Co. Ingots of this type are octagonal in section and are currently made with diameters of 12, 14, 16, 18, 20 and 22 inches across the flats. The heights poured in each diameter range from about 60 to 100 per cent of the diameter. This with the six previously mentioned diameters gives ingot weights ranging from 250 to 1900 pounds, each ingot being of a weight to produce a single tire or wheel.

Top Cropping is Eliminated

The distinguishing feature of the individual ingot is the fact that it does away with all top cropping, the only discard necessary being the central core removed in punching the bloom. This is less than 3 per cent of the weight of the ingot. This result is obtained by eliminating piping and concentrating segregation. The steel is practically solid throughout. This solidity is the result of maintaining the top of the ingot fluid so that it can follow all shrinkage as it takes place and prevent the formation of cavities. To se-

From a paper presented at the sixteenth general meeting of the American Iron and Steel Institute, New York, Oct. 24. The author, Lawford H. Fry, is with the Standard Steel Works Co., Burnham, Pa.

cure satisfactory ingots it has been found necessary to have well-made, dead-melted steel; to have a properly designed mold, and to apply a suitable carbonaceous material to the top of the steel as soon as it is poured.

Improvements in Design

Since the introduction of the individual ingot further improvements in its design and manufacture have been made. The circular cone section has been replaced by an octagon cross section with a straight vertical side and the material now used to keep the top hot is a special compound described below. Many investigations of the short octagon ingots made with pipe eliminator have shown that the freedom from piping is typical and can be secured in regular practice. Segregation is also confined within satisfactory limits.

Individual ingots have been made with both acid and basic open-hearth steel, and could be made with electric steel if occasion arose. This is not equivalent however to saying that "any steel will do." It is essential that the steel be well made, properly deoxidized, and dead-melted, without any tendency to "wildness" or boiling. That is to say the evolution of gas by the steel in the mold must be reduced to a minimum. The ingots should be carefully inspected for piping, rough tops or other defects. In particular any ingots showing signs of having boiled or risen in the mold should be rejected as they will be honey-combed to a dangerous extent. If the open-hearth practice is kept up to the mark and care is taken with the pit practice, indvidual ingots can be made to pass the necessarily severe inspection with rejections well under 1 per cent.

In a good mold it is important to have the walls thick at the base and thin at the top so that the chill effect is greater at the base, and cooling progresses from bottom to top of the ingot. It is also essential that the height of the ingot should be in proper proportion to the diameter. If the ingot is too flat the segregated area will be wide compared with the punch diameter, while too high an ingot will tend to give excessive piping. It has been found desirable to keep the height between 60 and 100 per cent of the diameter of the octagon.

A satisfactory material has only been arrived at by a continuous process of trial and elimination. In the manufacture of multiple ingots with hot tops, it has long been a common practice to add powdered coke, charcoal or coal to the upper surface. In the case of such ingots where a considerable discard is made so as to reject recarburized metal, satisfactory results can be obtained with such materials. In the case of individual ingots, however, the problem is much harder. The work required of the material is complex and the difficulties encountered with other materials have been such as to narrow the choice to the compound, known as pipe eliminator.

The material used must keep the ingot top hot and at the same time leave it with a smooth uniform surface. It must also prevent a recarburization of the surface. It has been found that to give these results the pipe eliminator must be finely divided and must carry a small amount of volatile matter so that it will ignite rapidly on application to the steel. There must also be present sufficient inert material or ash, which, after ignition, forms a blanket between steel and eliminator preventing undue absorbtion of carbon by the steel. It is further necessary to have a considerable proportion of slow burning fixed carbon so that the top is maintained hot during the solidification of the ingot.

Open-Hearth Pit Practice

When the pouring conditions are considered it is obvious that there is a good deal of difference between the "set-up" for bottom-poured, multiple ingots weighing from 5000 to 12,000 pounds, and, individual top-poured ingots with an average weight of about 900 pounds. The grouping of the long, bottom-poured ingots is well known, but the arrangement of an open-hearth pit floor adopted for this practice may be of interest. The ladle of 50 tons capacity is carried on a gantry so as to just clear the ingot molds, which are set up on five lines of base plates. The height is kept as low as possible to avoid splash. The ladle has two stoppers spaced to correspond to the base plates, so that with two operators a brace of ingots can be poured at once.

Accurate Weight is Essential

The base plates are carefully inspected and any defective bottom bricks repaired or replaced; molds of the size ordered are set up and a chalk mark made on the inside of each to show the height to which the steel is to be poured to give the weight required; the steel is poured to the chalk mark, and a scoopful of pipe eliminator added; when the ingots have set, the molds are lifted off and as soon as the ingots are cold enough to be magnetic they are transferred by magnet to the classifying shed. Accuracy in the weights of the ingots is essential and with an average weight of about 900 pounds the tolerance allowed is 10 pounds under and 25 pounds over the ordered weight.

Table II

Sizes of 12-Sided Fluted Tire Ingots

Nominal Diameter Inches	Approx. Weight Pounds	Ingot body: Diameters: At top: Length Inches	At top: Across Hollows Inches	At top: Across Points Inches	At bottom: Across Hollows Inches	At bottom: Across Points Inches	Ingot top: Length Inches	Ingot top: Diameters: Top Inches	Ingot top: Diameters: Base Inches
16	5400	84.7	16.5	18.6	15.3	17.1	10	17	15
18	6800	84.7	18.5	20.4	17.3	19.3	10	19	17
20	8400	84.7	20.5	22.7	19.3	21.6	10	21	19
24	11000	84.7	23.5	25.7	21.9	24.5	10	25	23

Table I

Chemical Analyses of Tire and Wheel Steel

Product	Carbon per cent	Manganese per cent	Phosphorus per cent	Sulphur per cent	Silicon per cent
Tires Class A.....	0.50 to 0.70	not over 0.75	not over 0.05	not over 0.05	0.15 to 0.35
Tires Class B.....	0.60 to 0.80	not over 0.75	not over 0.05	not over 0.05	0.15 to 0.35
Tires Class C.....	0.70 to 0.85	not over 0.75	not over 0.05	not over 0.05	0.15 to 0.35
Rolled Wheels (Acid)	0.60 to 0.80	0.55 to 0.80	not over 0.05	not over 0.05	0.15 to 0.35
Rolled Wheels (Basic)	0.65 to 0.85	0.55 to 0.80	not over 0.05	not over 0.05	0.15 to 0.35

At the annual meeting of the Wright-Martin Aircraft Corp., President George H. Houston said that 47,644 shares of the 500,000 shares of preferred outstanding had been deposited in favor of the consolidation plan with the International Motor Truck Co., New York. Of the common stock 746,908 shares of the outstanding 897,000 have been deposited.

The Mercer Motors Co., a newly formed Delaware corporation, has purchased the plant of the Mercer Automobile Co., Trenton, N. J. Emlen S. Hare, of New York City, formerly vice president of the Packard Motor Car Co., of Detroit, is president of the new corporation. The new company has an authorized capitalization of 110,000 shares of common and no preferred stock. It will provide $1,000,000 additional capital for the expansion of the Mercer plant.

Applying X-Ray to Study of Steel

Practical Application of Metal Radiography in the Workshop is Limited to About 1½ Inches of Steel, But for Purely Research Purposes Greater Thicknesses are Possible of Examination

BY W. E. RUDER

IN 1915 Dr. W. P. Davey described his investigation of a steel casting by means of X-rays and showed that flaws of certain kinds, such as blow-holes or fair sized slag inclusions, were readily discernible. Since that time much interest has been shown, both in this country and abroad, in the practical application of this new tool.

What Are X-rays?

X-rays are ether waves or vibrations of very short length (.000,000,048 —.000,000,036 millimeter) produced by the impact of cathode rays upon any substance. Cathode rays are streams of negatively charged electrons given off by the cathode under the action of high voltage and under conditions most favorable to ionization. These conditions may be that of a rarefied atmosphere (.006—.001 millimeter Mercury) or of a heated cathode in a very highly evacuated tube. Each electron in the cathode stream sets up a magnetic field perpendicular to its path, and the very rapid retardation of these electrons as they strike a substance (an X-ray target, for example) sets up electro-magnetic disturbances or other waves of short length, and consequently great penetrating power. These are called X-rays. Rays produced in this manner have the power of producing fluorescence from certain salts of the alkali and alkali-earth metals, of ionizing gases, of affecting the electric resistance of a selenium cell, of producing physiological effects in living tissue, and of affecting the photographic plate in much the same manner as visible light.

Waves of very short length are usually spoken of as "hard" and the longer ones as "soft." Hard rays have the greater penetration and for this reason high voltage is required when penetration is the primary consideration. In making a radiograph, however, not only is the penetration important, but the time of exposure is directly dependent upon the amount of X-rays that reach the emulsion. The intensity of radiation diminishes as in the case of visible light rays, with the square of the distance from the point of source to the surface of the object to be radiographed.

When visible light rays fall upon a transparent body, only a certain percentage of the rays pass through. Some are absorbed and others are reflected. Just so in the case of X-rays. Part of the impinging rays are reflected, that is, characteristic rays are produced, the incident rays setting up a secondary radiation characteristic of the substance upon which they fall. The second part is absorbed or scattered and so dissipated. Characteristic rays are produced only when the incident primary rays are more penetrating than the characteristic secondary radiation and their production is analygous to the production of fluorescent light.

Scattering is produced by deflection of the rays by internal structural surfaces in matter of any kind and increases with the thickness and atomic weight of the scattering medium. It corresponds to the scattering of visible light by fog. It is, then, this scattering and production of secondary radiation that puts such narrow limits upon the use of X-rays in examining substances, particularly those of high density, such as are encountered in radio-metallography.

Bearing in mind the foregoing brief survey of the underlying principles governing the application of X-rays, let us now consider their application to the study of metals.

Examinations Are Limited

Unfortunately we are, at present, limited in examining metals by means of a fluorescent screen, such as is used by physicians, to about 0.01 to 0.02 inch thickness of metal, and obviously, internal flaws in such thicknesses would be relatively unimportant. For the examination of a manufactured article, for the inspection of assembly, the screen has been successfully used. For most purposes, however, a photographic plate must be used so that the cumulative effect of time may be utilized.

The time of exposure is appreciably shortened by the use of an intensifying screen, a fluorescent surface placed close to the plate and which under the influence of X-radiation, emits visible light rays of a color which readily affect a photographic plate. In metal radiography the use of such a screen is a necessity, owing to the thickness and high atomic weight of most metals. Calcium tungstate, which emits a blue light under these conditions, is particularly suitable for the purpose. It must, however, be of very fine grain because this grain shows up in the negative.

What Radiographs Are

Radiographs are *detail shadowgraphs* and as the rays cannot be focused as in ordinary photography, the image will always be "life size" or larger. Moreover, the rays producing the shadows are not parallel but emanate from a point source. For this reason variations in intensity caused by differences in density in the object will be sharper when near the emergent side, and their sharpness will diminish and their size apparently increase as they are nearer to the incident side. This point-source distortion is diminished by increasing the distance of the tube from the object, at the same time, however, decreasing the intensity of the rays.

Most important, however, is the protection of the operator from the action of both the direct and secondary rays. Owing to the high penetrating power of the rays used, protection is even more important in metal radiography than in radio therapeutics. Too great care cannot be taken to guard against these rays. Complete protection should always be provided for.

A suitable arrangement for the making of radiographs consists of a camera which is merely a special plate holder, light-tight, of course, and carrying an intensifying screen. The object is placed on this camera directly. If the sides are not parallel, unsatisfactory results, due to unequal penetration, will result. In the case of curved surfaces, a film and flexible screen must be used.

The distance between the X-ray

From a paper presented at the sixteenth general meeting of the American Iron and Steel Institute, New York, Oct. 24. The author, W. E. Ruder, is research metallurgist, General Electric Co., Schenectady, N. Y.

tube and the object is so regulated that a uniform effect may be obtained over the whole plate. For a 5 x 7-inch plate, this distance should be at least 15 inches.

The time of exposure is the most important consideration and has, unfortunately, been given little attention in previous publications. It is particularly desirable in investigating a new field, that all data be given. In this case, voltage, current, distance from plate to tube, time of exposure and kind of plate should be recorded.

Now it is evident that, provided the voltage is high enough to cause even a small amount of radiation to pass through the metal, a radiograph can be obtained if sufficient time is allowed. The time required is also a direct function of the intensity of the rays, that is, of the current passing through the tube. The exposure may then be referred to in terms of milliampere-minutes at a certain spark-gap (voltage). The limit of milliampere-minutes a tube will stand is determined by the temperature of the target and the heating of the bulb. Most tubes, unless special arrangement for cooling is provided, will carry only five or six milliamperes continuously, at the voltage required for this work.

M. H. Pilon describes an experiment in which he successfully radiographed 2.16 inches of steel by an exposure of 2 hours and 48 minutes, using a Coolidge tube operating at six milliamperes and 120,000 volts.

Davey, experimenting with 150,000 volts was able to detect defects $\frac{1}{64}$-inch thick in 1½ inches of steel with a 60 milliampere-minute exposure, while a 90 milliampere-minute with 130,000 volts was sensitive to not less than $\frac{1}{32}$-inch difference in the same total thickness.

With the best apparatus at present on the market, the metallurgist will be limited to the use of a 10-inch (100,000-volt) spark gap. This will require an exposure of about three hours at five milliamperes to radiograph 2 inches of metal. This represents the present practical limits of the process. Of course, for purely research work, much higher voltages are available and have been used, making the practical radiography of greater thicknesses of steel a thing to be reasonably looked forward to, but for the present, this is still in the hands of the X-ray tube engineer.

A difference of from 50 to 75 per cent in time of exposure may result from different density of the metal and from the character of the defects it is desired to show.

In developing an X-ray plate, a slow developer must be used, due to the fact that the emulsion, usually thick and carrying a high silver content, is affected all the way through. Too rapid developments would fog the surface and the negative would lose sharpness.

The relative depth of flaws may be determined either by radiography from two points and calculating the depth or by making a stereoscopic radiograph. Owing to the severe requirements in the matter of high voltage, currents and long continued operation, the hot cathode or high vacuum tube gives the most satisfactory results, in metal radiography.

The examination of forgings for flaws presents greater difficulties than castings because such flaws usually occur as hair line cracks or lines which, unless they happen to run almost parallel to the path of the rays and in a straight line, would not be visible on the negative. Even under these favorable circumstances, differences in density due to these defects are difficult to detect, for the radiograph does not enlarge and shows only such defects as would be visible if exposed to the naked eye.

In order to determine the thickness of the smallest air inclusion which could be distinguished radiographically, two plates of steel were machined and ground to flat surfaces. In one of these a slot was cut to give a wedge of air of varying thickness. Each plate when finished was $\frac{5}{16}$-inch thick. The two steel plates were then bolted together and radiographed at 15-inch gap. In this manner it was found that an air inclusion 0.021-inch could be detected in 1¼ inches of steel and an air inclusion 0.007-inch could be detected in a total thickness of $\frac{5}{16}$-inch of steel. This is, of course, under the most favorable conditions, when it was known beforehand that the inclusion existed and just where it was.

A similar experiment made with a radiograph. In this case a total thickness of ¾-inch was used, and we find that when the inclusion is near the plate a thickness of 0.014-inch may be distinguished when $\frac{1}{8}$-inch from the plate a slightly greater thickness is necessary and when on the side away from the plate the air inclusion must be at least 0.030-inch thick and be detected under the most favorable conditions.

X-Ray Supplements Magnetic Testing

BY HENRY M. HOWE

TWO distinct fields for magnetic testing was brought out by R. L. Sanford in his paper entitled "Testing Steel by Magnetic Analysis," which is found on page 1181. First, a magnetic comparison between rails, eye-bars or other products which we do not wish to destroy on one hand, and test pieces cut from crop ends which we do destroy by means of our tensile and impact tests. Each lot is accepted or rejected, as a whole, on the destructive test physical of coupons or other test pieces. Then each rail, eye-bar, etc., of the lot is tested magnetically and without injury in comparison with those test pieces. Any rail, which differs magnetically from the test piece, is either rejected or re-treated, or subjected to special scrutiny. This test should detect any deviations in the rails from the quality of the test piece, caused either by heat treatment, mechanical treatment, segregation or error in composition.

Second, a uniformity test, applicable most easily to pieces of uniform cross sections like rails, wire, cables, etc. These may be passed rather rapidly by the magnetic testing device, which should indicate all important flaws and inclusions. Any suspicious rails or parts can then be examined exhaustively, perhaps by X-rays, resonance tests, or by electrical resistance tests, and in extreme cases even by density tests.

To apply either of these magnetic tests to the forging, prior to machining, might save a great loss of time and money, by preventing the machining of defective forgings. Though such tests should be applied most easily to pieces of uniform cross section, they might easily be modified so as to apply to those of varying section. A single master piece, such as a gun forging, proved by exhaustive

(*Concluded on Page* 1191)

Discussion of R. L. Sanford's paper presented at the Sixteenth general meeting of the American Iron and Steel Institute, New York, Oct. 24. The author, Henry M. Howe, is professor emeritus, Columbia university, New York.

Expert's Read Papers Before Institute

WILFRED SYKES
Westinghouse Elec. & Mfg. Co., East Pittsburgh

WILFRED SYKES, who presented a paper on the electrification of reversing steel mills, is in charge of the marine and steel-mill work of the general engineering department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. He has been associated with the Westinghouse company since 1909, and is regarded as an authority on matters pertaining to electrical hoisting and the electrification of rolling mills, mines and similar lines of industry. He is a native of New Zealand and is a graduate of the Technical college of Melbourne, Australia. Before coming to this country he was associated with Knox, Schlapp & Co., Melbourne; Shoerker & Fischer, Melbourne, and the Allgemeine Elektricitate Gesellschaft, first at Melbourne and later at the Berlin office of that company. Recently Mr. Sykes has been doing extensive work in connection with electric ship propulsion.

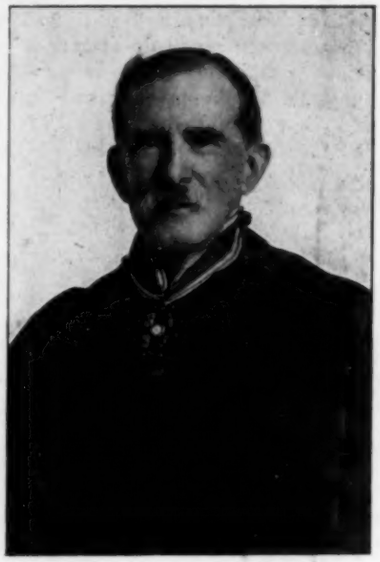
* * *

RAYMOND L. SANFORD, who presented a paper on magnetic analyses of steel, is secretary of the committee on magnetic analysis of the American Society for Testing Materials, an associate physicist at the bureau of standards, Washington, and chief of the magnetic laboratory at the bureau. Mr. Sanford, who is 35 years of age, has been with the bureau since 1910, following two years as instructor in physics and electrical engineering at the University of Vermont from which he was graduated with the degree of bachelor of science in electrical engineering in 1907. His work in research and testing won for him position of chief of the magnetic laboratory on July 1, 1918. Mr. Sanford developed a method for determining the degree of magnetic uniformity along the length of a steel bar, the results of which were published by the bureau of standards in 1916.

* * *

HENRY MARION HOWE, who spoke on "The Open-hearth Furnace and Processes," is well known for his contributions to metallurgical literature, having been awarded the Bessemer gold medal by the Iron and Steel institute in 1890 for his standard work, "The Metallurgy of Steel." He was born in Boston in 1848, and was graduated from Harvard college in 1869 and from the Massachusetts Institute of Technology in 1871. He was appointed professor of metallurgy in Columbia university in 1892, and is now professor emeritus. In 1877 he went to Chili in connection with copper smelting works, and

RAYMOND L. SANFORD
Physicist, Bureau of Standards, Washington



DR. HENRY M. HOWE
Professor Emeritus, Columbia University

subsequently designed and built the works of the Orford Nickel & Copper Co., at Capelton and Eustis, Canada, and also those at Bergen, N. J.

* * *

GEORGE K. BURGES, who presented a paper entitled "Temperature Measurements in Steel Furnaces," is chief of the division of metallurgy, bureau of standards. Before becoming a metallurgist he was a physicist, and his early training has proved of inestimable value in his present work. Since the establishment of the metallurgist division in 1913, 10 years after he became connected with the bureau, Dr. Burgess has been endeavoring to find the foundation of physical principles in metallurgical problems. Before joining the staff of the bureau he devoted two years as instructor in physics in the University of California, and one year in the University of Michigan. He studied the subject for two years in Paris, and for two additional years in a post graduate course at the Massachusetts Institute of Technology. His research work is known to many steel manufacturers. He is endeavoring at present to obtain action by a committee of steel makers and consumers toward determining the phosphorous and sulphur limits in all grades of iron and steel.

Give Results of Their Research Work

W. F. RUDER
Research Metallurgist, General Electric Co.

W F. RUDER, who read a paper on X-ray examination of metals, is a specialist in the manufacture and heat treatment of sheet steel for magnetic purposes. He was born Dec. 22, 1886, in Stockdale, Pa., was graduated from the Pennsylvania state normal school in 1903, and from the Pennsylvania State college in 1907 with the degree of bachelor of science, in electrical engineering. Since 1907 he has been in charge of metallurgical research at the research laboratory of the General Electric Co., Schenectady, N. Y., and also is in charge of the development of magnetic materials, transformer department, General Electric Co., Pittsfield, Mass. He is a member of six metallurgical committees of the National Research council. His publications include "Grain Growth in Metals," "Metallurgy of Arc Welding" and "Colorizing of Metals."

* * *

LAWFORD H. FRY, who presented a paper on the manufacture of ingots for locomotive tires and rolled wheels, is associated with the Standard Steel Works Co., Burnham, Pa., and has had considerable experience in this department of the steel industry. He submitted some interesting data on tires and steel wheels and chemical analyses as shown by his experiments. The practice of using multiple and individual ingots for locomotive tires and rolled wheels is well established in America, he said, the choice of the two depending upon local manufacturing conditions.

* * *

VAN H. MANNING, director of the bureau of mines, described the work of the bureau in co-operation with the iron and steel and coal industries, his paper being in the nature of a summary of the work accomplished by the bureau since its establishment nine years ago. The purpose of the bureau is to conserve life and health and prevent unnecessary waste of the mineral wealth of the country, and

VAN H. MANNING
Director, Bureau of Mines, Washington

while some research work has been done along the line of preventing accidents at blast furnaces and in steel mills, the bureau has concentrated its efforts at mines, and especially at coal mines. Mr. Manning said the iron and steel industry itself is rendering an invaluable service in accident-prevention work. In its research work in the conservation of minerals, Mr. Manning said the bureau is hopeful that some means will be found for the beneficiation of low-grade iron ores, as it is estimated that the present supply of iron ore available for commercial use is sufficient only for 30 years.

X-Ray Supplements Magnetic Testing

(*Continued from page* 1189)

tests to be sound, and of the desired composition and thermal and mechanical treatment, would give a master curve in the comparison and uniformity tests. All duplicates of this forging should give curves like this master curve, and all which do not should be retreated, retested or rejected. Steel intended for surgeons' instruments, might well be tested magnetically.

I have in passing suggested the X-rays as supplementary to the magnetic tests. This would seem to be their proper function. The whole product of a mill could be tested magnetically with little cost, whereas the X-ray test is so tedious that it should be applied only to parts already shown by other means to be suspicious, and to pieces of such importance that every precaution should be taken to detect defects.

I found great interest in X-ray testing in England, where I attended a very enthusiastic meeting of the Faraday society, called by Sir Robert Hadfield and devoted wholly to this subject.

The X-rays thus far give nothing but a shadow test, which can detect small inclusions and flaws only in case they are in the immediate neighborhood of the photographic plate, and hence, only when they are near the surface of the piece. Large inclusions and flaws nearer the center of large pieces should be detected more readily by other means.

None of these tests promises to be able to detect alumina resulting from the use of aluminum, for this is likely to form thin discontinuous films, which in rolling and forging, become distributed rather evenly. Its infusibility prevents its coalescing into considerable masses. Should not its use in making important products on which life depends be forbidden with severe penalties?

Labor Seeks Union Domination

Open Shop is Focal Point of Labor Problem—Labor Group Would Abolish Workers' Organizations Not Affiliated With Federation—Unorganized Employers Must be Represented—Bolshevism Must Go

BY E. H. GARY

THE attention of the members of the American Iron and Steel institute has of late been focused on the attempt of leaders in the American Federation of Labor to unionize the iron and steel industry of this country.

The present campaign was started at St. Paul, June 13, 1918, by the adoption of a resolution introduced by delegate W. Z. Foster, couched in the following language:

"WHEREAS, The organization of the vast armies of wage earners employed in the steel industries is vitally necessary to the further spread of industrial democracy in America; and

WHEREAS, Organized labor can accomplish this great task only by putting forth a tremendous effort, therefore, be it

RESOLVED, That the executive officers of the American Federation of Labor stand instructed to call a conference, during this convention, of delegates of all international unions whose interests are involved in the steel industries, and of all the state federations and city central bodies in the steel districts, for the purpose of uniting all these organizations into one mighty drive to organize the steel plants of America."

The movement appears to have proceeded, under the general direction of Foster, without much result until June 13, 1919, when another resolution was adopted by the American Federation of Labor at a meeting held in Atlantic City, which reads as follows:

"WHEREAS, Every labor union in America, regardless of its trade or industry, has a direct and positive interest in the organization of the workers in the iron and steel industry, because the accomplishment of this vital task will greatly weaken the opposition of employers everywhere, to the extension of trade unionism and the establishment of decent conditions of work and wages; and

WHEREAS, The organizing force now in the field working upon this vast project is altogether inadequate in strength to carry on the work in the vigorous manner imperatively demanded by the situation; therefore, be it

RESOLVED, That President Gompers of the American Federation of Labor, and Chairman of the National Committee for Organizing Iron and Steel Workers, be authorized to call a conference, during the convention of the American Federation of Labor of all international unions affiliated with the A. F. of L., to the end that they make arrangements to lend their assistance to the organization of the iron and steel industry."

President Gompers thereupon named the heads of 24 affiliated organizations to act as a committee to develop and carry out plans for unionizing the iron and steel industry pursuant to the resolutions mentioned. You are familiar with what has occurred since that time and you are more or less acquainted with the history of the different union leaders who have been connected with the attempt to enlist the employes and to bring about a strike in the manufacturing works. The strike, which has been directed by the union labor leaders and was begun, so far as I am informed, without any request or authorization from the workmen themselves, has been conducted in the usual way. Immediately preceding the day fixed for ordering out the men, intimidating letters, large numbers of them being anonymous, were sent to the families of the workmen threatening physical injury to the father or husband, damage to or destruction of the home and kidnapping of the children unless the employe referred to should obey the order to strike. A number of the workmen, who had joined the unions voluntarily, accepted the order to strike and others remained away from the factories through fear. In many, if not most of the mills, the larger number of employes continued to work without interruption. At the beginning many of the workmen who attempted to continue their work and others who had remained at home through fear and attempted to return, were confronted in the public streets and elsewhere by strikers, or pickets, and importuned to engage in the strike; and many were assaulted and seriously injured. After protection was afforded by the police, sheriff's deputies, state constabulary and, in some cases, state or national troops, the numbers resuming work increased appreciably from day to day until in many places operations are about normal. Taken as a whole, the situation at present is good and steadily improving.

It will be observed that the strike is not the result of any claim by any workmen for higher wages or better treatment nor for any reason except the desire and effort on the part of union labor leaders to unionize the iron and steel industry. As stated in the first resolution, the action taken was "for the purpose of uniting all these organizations into one mighty drive to organize the steel plants of America."

Without discussing for the present the merit or demerit of labor unions it may be observed that union labor leaders openly state that they seek to unionize or, as they say "organize" the whole industry of this country. Those who do not contract or deal with unions, although they do not combat them, insist upon absolute freedom to both employer and employe in regard to employment and the management of the shops. The nonunion employers and employes both stand for the open shop. The unions argue for the closed shop or, as the leaders now insist, "the right of collective bargaining through labor union leaders." Every proposition contended for by

No Room for Anarchy

*CONSIDERABLE has been said in public of late concerning the attempt to spread the doctrine of bolshevism in this country. All of us have known for some time that this disease is persistent and that there has been some inoculation even in this best of countries. Still we deny that there is danger of serious trouble. There is only one way to treat this disease and that is to stamp it out, to meet it boldly wherever it can be found, to expose it and give it no chance for development. In this free country * * * * there is no room except in the prisons for the anarchist, the bolshevist or other individual who seeks to substitute the rule of force for the rule of law and reason.*—E. H. GARY.

Opening address delivered by President Gary before American Iron and Steel Institute, New York, Oct. 24.

the labor unions at the national industrial conference at Washington led to domination of the shops and of the men by the union labor leaders. Every position taken by the other side centered on the open shop. This is the great question confronting the American people and, in fact the world public. From 80 to 90 per cent or more of the labor in this country is nonunion. It is for them and the employers generally and the large class of men and women who are not, strictly speaking, employers or wage earners, to determine whether or not it is best for the whole community to have industry totally organized.

Fundamental Issue is Open Shop

I think the fundamental question submitted to the conference for recommendation to industries was the open shop. That question apparently could not be decided by majority vote for the reason that the conference was organized into three groups called labor, employers and public. No affirmative action under the constitution or adopted rules could be taken except by the unanimous vote of the three groups each of which voted by a majority of all its members.

The union labor advocates stand for collective bargaining through the unions. The others favor collective bargaining through representatives selected by the employes themselves from their own numbers.

The public group offered the following resolution:

"The right of wage earners in trade and labor unions to bargain collectively, to be represented by representatives of their own choosing in negotiations and adjustments with employers in respect to wages, hours of labor and relations and conditions of employment, is recognized.

"This must not be understood as limiting the right of any wage earner to refrain from joining any organization or to deal directly with his employer if he so chooses."

The public group voted in favor of this resolution. The employers group and the union labor group voted against it.

The union labor group finally offered the following resolution:

"The right of wage earners to organize without discrimination, to bargain collectively, to be represented by representatives of their own choosing in negotiations and adjustments with employers in respect to wages, hours of labor, and relations and conditions of employment is recognized."

It was stated by Mr. Fish of the employers group that "we cannot read this resolution without reference to the history of the last two weeks, and the events of yesterday. * * * * As the argument in this conference has developed, it has been perfectly clear that the sum and substance of the resolutions with reference to collective bargaining that have been presented heretofore, excepting the substitute from the employers' group, the Chadbourne resolution and the substitute offered for it by the employers' group, that these resolutions in substance meant this and nothing else, that this conference is asked to take action which will force, if possible the hundreds of thousands of employers in industries throughout this country to recognize the labor unions whether they will or will not, and to force their organizations to deal with the labor unions against their will. * * * * I shall personally feel obliged to oppose this resolution unless there is a plain definition as to what is meant by bargaining collectively."

The union labor group and the public group voted in favor of the resolution. The employers' group voted against it. Thereupon the union labor group retired from the conference.

All through the conference whenever the question of collective bargaining was discussed, it was apparent that the union labor leaders would not support any resolution in favor of collective bargaining except on the basis that collective bargaining meant bargaining through labor unions. For instance, on Tuesday when the two first resolutions above quoted were under discussion and ready for vote, Mr. Chadbourne for the public group spoke as follows:

"Mr. Chairman, I want to make a statement and to ask a question or two of Mr. Gompers with the chairman's permission." (Turning to Mr. Gompers.) "Mr. Gompers, the public group will retire and reconsider its vote, with the recommendation of its chairman, Mr. Baruch, if you and your group will do either one of two things: either add, 'or other organizations' after 'labor and trade unions' in the resolution, or give it as your group's interpretation upon this record equally as solemn as the vote that is taken upon the resolution, that it is the interpretation of the gentlemen in your group that it does not mean any other organization or any other association."

To this the union labor group would make no response.

As further evidence of the attitude of the union labor leaders it may be mentioned that in the 12 points published by the leaders who were conducting the strike they included and insisted upon the following:

"Abolition of company unions."

The unions claim that collective bargaining through different forms of shop organization made up of the employes tends to limit the extension of unions by increasing their members. The nonunion employes and their employers insist that collective bargaining through labor unions means that employes are forced to join the unions as otherwise they could not be represented. So it is perfectly clear that the whole argument returns to the main proposition of open or closed shop.

And yet it would be unfortunate if we could not discover opportunities for further improvement; if we failed to read or to listen to the criticism of others; if we let pass the requests or suggestions of our workmen for changes which they believe would be proper concerning their employment; if we neglected to give our employes, individually or in groups, opportunities to discuss with the managers all questions of mutual interest; if we minimize in any degree the well recognized fact that the public good is of prime importance and that private interests must be subordinated.

Must Stamp Out Bolshevism

Considerable has been said in public of late concerning the attempt to spread the doctrine of bolshevism in this country. All of us have known for some time that this disease is persistent and that there has been some inoculation even in this best of countries. Still we deny that there is danger of serious trouble. There is only one way to treat this disease and that is to stamp it out, to meet it boldly wherever it can be found, to expose it and give it no chance for development. In this free country, with its reasonable laws wisely administered, its golden harvests, healthful climate, peace-loving inhabitants who are generous in contributions for relief and protection, schools, churches and hospitals, there is no room except in the prisons for the anarchist, the bolshevist or other individual who seeks to substitute the rule of force for the rule of law and reason. If there are slinking, desperate, murderous bolsheviki in this country, even in small numbers, I believe the secret service department of the government should detect and expose them and that the iron hand of justice should punish them as they deserve, and as I have faith in this country and in its institutions, I believe this will be done and done promptly. Any one who doubts the ability of the proper authorities to protect the persons and property of our people against bolshevism and other similar doctrines, fails to appreciate the courage of our citizens and the terrible force and strength of subdued calmness when they are surrounded by threatened danger.

Institute Indorses the Open Shop

Iron and Steel Manufacturers Give Judge Gary Great Ovation for His Stand Against Domination of Radical Unionism—King Albert is Honor Guest at Banquet—Meeting Makes Notable History

Steel Industry Solidly Backs Judge Gary's Stand

WHEREAS: Elbert H. Gary, president of the American Iron & Steel institute, has rendered to the American people and the American iron and steel industries a service of inestimable value by his course as a representative of the public in the industrial conference at Washington; therefore,

Be it resolved, That the American Iron and Steel institute, assembled in its semiannual meeting, hereby records its unqualified approval of Mr. Gary's firm stand against any infringement of the rights of the individual in labor or in business, rights fundamental to American industrial supremacy as well as to American liberty. That it admires the vision and courage enabling him to discern and effectively oppose the radicalism injected into trade unionism by unscrupulous leaders, an element especially dangerous under present conditions, when world-wide unrest has created an opportunity for agitation aimed at the perpetuity of institutions under which our country has achieved its strength and our industries attained their efficiency and prosperity.

MARKED by extraordinary events and conditions of a highly impressive and momentous character, the sixteenth general meeting of the American Iron and Steel institute at the Hotel Commodore, New York City, Friday, Oct. 24, contributed notably to the history of that organization.

Outstanding in its national significance in connection with the present exorbitant demands of the radical elements of union labor and the wide sweep of strikes in this country, was the full indorsement of the principle of the open shop as advocated by Judge Gary in the steel strike and before the industrial conference at Washington. Resolutions formally approving Judge Gary's stand were adopted with enthusiasm. Judge Gary himself was given probably the greatest ovation of his career both at the opening session and at the banquet in the evening.

The banquet in all respects, was without parallel in the long list of similar functions of the past. King Albert of Belgium attended as the guest of honor and gave a message of good will and of appreciation of the American iron and steel industry to the assembled manufacturers. The presence of Eugene Schneider, head of the Creusot works of France and president of the Iron and Steel institute and other European guests, gave the affair a decidedly international aspect. The attendance at the meeting was unusually large.

King Albert Given Warm Greeting at Banquet

SCENES unparalleled at any other similar function in former years made the banquet at the Commodore hotel Friday evening probably the most notable in the history of the American Iron and Steel institute. The dinner was graced by the presence of King Albert of Belgium and suite, by the king's son and heir, Prince Leopold, and by various other international figures of prominence, among which was Eugene Schneider, president of the Iron and Steel institute of Europe, and president of the Le Creusot steel works of France.

King Albert was given a highly cordial and truly American reception. His entrance brought the guests to their feet in a burst of prolonged cheering. Then with the banquet hall darkened, the spot lights were directed upon the Belgian and American flags and the national airs of the two countries were played in turn, by a concealed orchestra, while the 1300 present stood at respectful attention. There followed three cheers for King Albert and then a similar demonstration for Prince Leopold.

A toast was called and drunk to King Albert who responded by proposing a toast to the "President of the United States and a prompt recovery of his precious health."

"I thank very heartily Judge Gary for his very kind words. I thank you all for the especially warm manner in which you received his toast," the king continued.

"With his permission, I should like to call Judge Gary an old friend of Belgium. It is indeed for me a great pleasure and real privilege to address this assembly of the great men of one of the great industries of the world. Circumstances did not permit me to visit more than two of your big steel plants, but I know they are all unrivaled in the world for up-to-dateness and efficiency. There is much for my countrymen to be learned from you, especially under present conditions."

The international character of the occasion was further signified by the address of Monsieur Schneider, the French steel leader and president of the European Iron and Steel institute who is now in this country as the head of the French mission for the

international conference on trade matters. Monsieur Schneider stated that in view of his identification with the European institute and his having been made an honorary member of the American institute, the banquet might be considered as a symbol of international unity for peace and harmony in the future. He spoke of the generations of his family which have been connected with the development of the Creusot works and told of the part his father had taken in the establishment of the armor plate industry in the United States. He paid due recognition to the co-operation and aid supplied by the American iron and steel industry to France during the war and declared that out of this has come a close friendship which should be highly beneficial to both countries in future relations.

France's Dark Struggle Told

"I do not know whether in America you fully realize what the war meant to our steel industry, what a terrible blow the war struck it, and to what an almost superhuman test the industry was put," said Monsieur Schneider.

"Just remember that at the declaration of war most of our directors, engineers, foremen and workmen were mobilized. Sixty-seven per cent were called to arms. In August, 1914, the majority of our plants, even those situated farthest from the zone of war operations were obliged to close down. The unhappy outcome of the early battles served only to aggravate the situation. The largest steel plants in the east of France and our most productive coal fields either fell into the hands of the enemy or were in the theater of military operations. As early as October, 1914, France was deprived of the 20,000,000 tons of coal that the mines of the North and the Pas de Calais supplied.

"With one blow the steel industry lost 85 blast furnaces out of 156, 48 open-hearth furnaces out of 164 and 53 converters out of 100. Our means of production were reduced 81 per cent for pig iron and 63 per cent for steel, as compared with 1913. And it had to be just at this time, at the Battle of the Marne, that our government called upon us for a daily supply of 100,000 shells for 75 millimeter guns. We were not producing even 20,000.

"Gentlemen, I should not like anyone to pass through the hours through which we lived, the patriotic anguish that was strangling us, the fever that consumed us for long months. We got to work. We convinced public opinion that the army would have to return part of our staff. We appealed to the devotion of our women. For every woman employed in our metal industries before the war, we employed 390 in 1918. We raised to a maximum the output of the plants that we still retained. We built new ones. We toiled for four years day and night.

"In July, 1915, we had only 20 stacks at work. In January, 1916, we had 40 and January, 1918, 57. Before the armistice, in September, 1918, we had 59 in operation, 30 were down, and 13 in course of construction—a total of 102. Little by little we had made up for the enormous losses caused by the German invasion.

"In July, 1915, we had at our disposal 100 open-hearth furnaces, six down and 35 in course of construction. In September, 1918, we had 165 open-hearth furnaces in operation, 16 down and 44 in course of construction.

"In January, 1916, we had 1305 crucible furnaces. In September, 1918, we had 2459. In January, 1916, we had 21 electric furnaces; in September, 1918, we had 40.

"The result of this effort was that for every 100 rifles manufactured in 1914, there were 29,000 in 1918. For every 100 machine guns in 1914, we manufactured 7000 in 1918. At the beginning of the war we turned out each day 13,000 shells for the 75s and 200 for the 155s. In 1918, our production was 200,000 for the 75s and 45,000 for the 155s per day. In 1915, we manufactured only 2600 75-millimeter guns. Two years later, we manufactured 11,000. Our heavy artillery at the beginning of the war can hardly be said to have existed. Everyone knows that the surprise of the first battle of the war came chiefly from Germany's overwhelming superiority in heavy artillery. At the time of the armistice, we had 6500 heavy guns—3400 short 155s, 1100 long 155s together with other sizes up to 21 inches. France was thus enabled not only to meet her own needs, but was in a position to equip the entire Serbian army, to send considerable quantities of heavy artillery, rifles and machine guns to Russia, Roumania and Greece as well as to supply the American army with all the field artillery it needed and half the heavy artillery.

What Alsace-Lorraine Means

"As you know, the restitution of Alsace-Lorraine is of very great importance to the French steel industry. The resources of the iron ore beds are estimated at 1,832,000,000,000 tons, and the annual production of the Lorraine district which was formerly under German domination equaled 21,156,000 tons. This will double the ore production in France and will make her by far the largest ore producer in Europe.

"Alsace-Lorraine possesses 66 blast furnaces, producing 3,870,000 tons of iron, and 26 converters and 10 open-hearth steel furnaces that produce 2,286,000 tons. This additional production of pig iron and steel not only covers the present needs of France but leaves a surplus for export. Including the production of Alsace-Lorraine, France now stands second as an iron and steel producing country, excelled only by the United States.

The situation may be summarized as follows:

Iron Ore—
22,000,000 tons before the war.
43,000,000 tons after the war.

Pig Iron Over—
5,000,000 tons before the war.
10,000,000 tons after the war.

Steel—
5,000,000 tons before the war.
8,000,000 tons after the war.

Gaston Liebert, French consul general, took the occasion to thank Judge Gary for his stand towards bolshevism and spoke of the encouraging progress which France had made in combating radical tendencies of this character. He alluded to the proverbial thrift of the French people and the soundness of their investments. He emphasized therefore that should France ask for long credits from the United States it would be because they are needed and he assured American business men that they need have no hesitancy in granting these as a safe investment.

Taking up Monsieur Liebert's allusion to bolshevism, Judge Gary said: "Is bolshevism to be feared? It is in the sense that the bandit, the robber, the burglar or any other criminal who may plan to do wrong is to be feared. But in this country, where the citizens are loyal, patriotic and stubborn for the right, there is no danger from bolshevism, in the sense that it can threaten this nation's existence or civilization's."

Lewis Nixon, public service commissioner of New York, predicted that the rapid transit system of New York would be bankrupt by Jan. 1 unless quick assistance to it was forthcoming in the way of higher fares. He described the tremendous growth of the transportation requirements of the metropolis and foretold the future extensions of its rapid transit system, which would command the interest and attention of the engineering and steel industries. Mr. Nixon expressed the belief that the present opposition to granting increases to transportation companies would pass in time but perhaps not sufficiently soon to avert many bankruptcies.

Admiral S. S. Fletcher, who during the war was closely in touch with the iron and steel industry in supplying the nation's needs, paid a tribute to the manufacturers for their wholehearted response, and stated that the co-operation of the government and industry in that crisis had taught many things which would be of untold value to the country should any such future emergencies arise.

Gary Gets an Ovation

Judge Gary was accorded a great demonstration by the assembled iron and steel men as he entered the convention hall for the opening session Friday morning. The moment Judge Gary ap-

peared in the hall every man in the room sprang to his feet with cheers and applause. The ovation continued as Judge Gary proceeded down the long aisle to the speakers' platform and for several minutes thereafter. Judge Gary was visibly affected by the demonstration. "I recognize you have been whole heartedly applauding a principle that pertains to the very life of progressive industry. But I want you also to know that I fully appreciate and will always remember your personal kindness to me."

At this juncture, Willis L. King of the Jones & Laughlin Steel Co., took the chair and recognized Joseph G. Butler Jr., who presented a resolution expressing the recognition of the American iron and steel industry of Judge Gary's service in the industrial conference at Washington and of its full and unqualified approval of the position he had taken against the radical doctrines and demands of present-day trade unionism. "The American Iron and Steel institute owes a debt to Judge Gary, it owes a debt to itself, it owes a debt to the entire iron and steel industry of the United States. I may even go further, it owes a debt to the country, and perhaps still further, it owes a debt to the entire world. I am going to give you an opportunity to discharge this duty." Mr. Butler then presented his resolution which was seconded by E. A. S. Clarke, and was adopted without dissent amid great cheering.

Judge Gary, responding, said:

Gentlemen, I thank you. I would be less than fair and less than sincere if in this connection I failed to emphasize the thought that while circumstances have happened to place me in a position which has centered your thoughts and your words of approval upon me, yet there is not much strength in anyone who happens to be prominently connected with or the leader of a movement unless he has the necessary support. And therefore I want to share the very generous confidence which you have expressed in words with large numbers of others.

I would like to say that from the outset the positions which have been taken by your president, as expressed in words, has been without exception approved by the finance committee of the United States Steel Corp., by its board of directors, by its stockholders as stated in many letters and telegrams which have been received by the board of directors of this splendid institution, of which we are all proud, by the iron and steel industry generally of the United States and Canada, by thousands upon thousands of individuals, chambers of commerce, associations and organizations, including farmers' institutions, scattered all over this country, from north to south and east to west; and I am glad to say by the intelligent, influential, splendid press of this country.

And so you and I, all of us, cheerfully, emphatically extend the sentiments of the resolution which has been passed to all these groups of individuals to whom I have referred.

Judge Gary then proceeded to deliver his opening address in which he carefully explained and analyzed the deliberations of the industrial conference at Washington of which he was a member, condemned the arbitrary attitude of the union minority of labor, and called for the suppression of Bolshevism in whatever form it shall appear in this country, with the iron hand of the law. His address frequently was interrupted with cheers and at its close there was another stirring demonstration.

Mine Bureau's Work Described

Van H. Manning, director of the bureau of mines, in his address describing the work of the bureau indicated important research investigations which have been carried out as it was proposed to make in connection with the iron and steel industry:

"Coming now to the bureau's work in connection with the iron and steel industry, I must say at once that, in proportion to the industry's importance, relatively little has been done," said Mr. Manning. "Iron ore and pig iron represent one-quarter of the value of the total yearly production of mineral wealth in the United States, but of the published researches of the bureau less than a tenth deal directly with problems in the iron and steel industry, and only about one-fifth with subjects that are at all closely related and would aid in the solution of those problems. The work of the bureau on safety and health conditions around blast furnaces and steel plants is doubtless well known to you. Broadly speaking, the organic act establishing the bureau defines its work as (1) looking after the safety and health of the miner, and (2) the prevention of mineral waste. Thus, when the time came to consider the problems connected with the iron and steel industry, it was the safety side of the subject that first received attention. In 1915 a bill passed by congress authorized the establishment of ten mining experiment stations of the bureau in addition to those which had already been established. The first three were established in 1916, all of them in nonferrous mining districts. Of the second three which were established, one was located in the northwest, and to it was assigned the problem of the beneficiation of low-grade iron ores. As is well known to all of you here, it has been estimated that the iron ore reserves of the country will last about 30 years at the present rate of consumption. However, this estimate is based upon the utilization of those ores which at the present time can be treated profitably in blast furnaces. Likewise, as you also know, there is a tremendous tonnage of ores throughout the United States, and especially on the Mesabi range which are too low grade to permit of their being treated in a blast furnaces without having undergone some form of beneficiation.

"In addition to the field of work I have just outlined, the bureau is, of course, also interested in all those problems which are confronting the iron and steel industry in connection with present day metallurgical practice. For example: As is well known, the so-called bessemer ores have been largely depleted and the problem has arisen as to how it may be possible to convert nonbessemer ores into bessemer ores. Considerable progress has recently been made along this line by certain commercial concerns.

"Another problem is that of overcoming the ill effects of sulphur when high sulphur coals are used in steelmaking. The supply of low-sulphur coals is running low and the steel industry at the present time finds it necessary to use high-sulphur coals. Therefore, the problem presents itself of removing this sulphur from the coal or else adding to the steel after it is produced, some element which will neutralize the effects of the sulphur and at the same time in no way decrease the essential properties of the steel.

"There is also the problem of the alloy steels; that is, of the production of steels having peculiar properties by reason of the addition of rare elements. The bureau in connection with this work on rare metals has made an extensive study of the mining, treatment and utilization of these rare metals."

W. E. Ruder, chief metallurgist of the General Electric Co., Schenectady, described the "X-Ray Examination of Metals" and this paper was discussed by H. S. Rawdin of the bureau of standards, Washington. R. L. Sanford, physicist of the bureau of standards, presented the subject "Magnetic Analysis of Steel." Dr. Henry M. Howe presented a discussion covering both X-ray and magnetic examinations. At the afternoon session Wilford Sykes of Westinghouse Electric & Mfg. Co., presented the paper on "The Electrification of Reversing Steel Mills," which was discussed by D. B. Rushmore of the General Electric Co.; Dr. Henry M. Howe, "The Open Hearth Furnace and Processes;" G. K. Burgess, chief of the division of metallurgy of the bureau of standards, "Temperature Measurement in Steel Furnaces"; and Lawford H. Fry of the Standard Steel Works Co., Burnham, Pa., "The Manufacture of Ingots for Locomotive Tires and Rolled Wheels." G. Aertsen, assistant to the vice president of the Midvale Steel & Ordnance Co. at Nicetown, Pa., discussed Mr. Fry's paper.

The directors of the institute at their meeting during the luncheon hour elected to honorary membership Sir William Beardmore of William Beardmore & Co., Ltd., Glasgow, the retiring president of the iron and steel institute, and Monsieur Schneider, the present president of that body and head of the Creusot steel works in France, who was present at the meeting.

Little American Steel Is Needed

Requirements of European Reconstruction Made Known at International Conference at Atlantic City—Long-Term Credits and Increase of American Imports Essential to Restored Trade Equilibrium—International Organization Formed

EUROPE is not going to require as much of American materials for its reconstruction as most people in the United States have been led to believe. This fact was brought clearly before the manufacturers and business men who last week attended the international trade conference held at Atlantic City under the auspices of the chamber of commerce of the United States. Even before such requirements as actually may be purchased in this country are finally provided, means of financing this business and extending credits over possibly a long period of years must be found. How best to supply the necessary funds was fully discussed publicly and privately during the conference, but upon adjournment it was still an undetermined matter. Steps were taken at the conference for the recreation of an international trade organization for continued mutual assistance.

Representatives of France, Belgium, Italy and Great Britain met Americans during the conference, first discussing individual national and international needs in private in committees, then in addresses in the open sessions of the conference, and in private interviews. The foreign delegates made a very favorable impression upon the Americans in attendance and frankly stated the conditions of their respective countries. Great Britain, it was found, will not need much American assistance except as this country can relieve her of some of the burdens of caring for the other European nations while Great Britain is engaged in settling her own problems.

France, Italy and Belgium need American aid and need it badly, but, as was emphasized by not only the visiting speakers but by the American participants in the general program, this assistance is not the kind required by weak, characterless nations, but by nations of strength and ability suffering from the ravages and privations caused by the war with Germany. Help will be given these countries, it was declared, just how is not known, but help will be extended. This was made clear time and again in the addresses given by the business men of the United States.

Industrial Needs of Europe Outlined

STEEL, it was discovered, will not be needed in such vast quantities as was generally supposed. France in 1920 will be in the market for only 100,000 tons of ship plates. Italy, for a period of five years, needs but 580,000 tons of iron and steel annually. Of this 200,000 tons is foundry pig iron, 100,000 tons of scrap, 60,000 tons of plates and shapes, 215,000 tons of ingots and semifinished steel and rails, and 5000 tons of tin plate. Belgium's requirements of semifinished steel are limited to unstated estimates which, it was said, will be diminished as the restoration of the Belgian works and mills progresses. England will need nothing, it was stated.

The reason for this limited aggregate tonnage, in comparison with the large requirements generally believed to be needed, is due to the progress France, Belgium and Italy have made in rehabilitating themselves following the signing of the armistice. While the world has been sympathizing with these countries and wondering how they may be helped, they have been hard at work and have accomplished much, the conference was told. What has been done, of course, is only a small proportion of what must be done to restore the devastated regions to anything near normal, but the fact that the factories, mills and workshops of these nations are steadily being rebuilt or converted to peace needs accounts in a measure for the limited tonnages which are to be purchased.

Eugene Schneider, head of the famous Creusot Steel Works, of France, chief spokesman for the visitors as a group and for France individually, explained how that nation has risen from fourth place in the world's production of steel to a position second only to that maintained by the United States. Her expected maximum output of 8,000,000 tons of steel resulting from war expansion and from recovery of her former provinces, will enable France to export at least 2,000,000 tons, Mr. Schneider declared. This statement was made in explanation of why the demands upon the United States will not be as large as was expected.

Financing is Chief Problem

Finance is the crux of the entire international trade problem, it was shown, and the very thing around which depends the reduction of the enormous trade balance piling up in favor of the United States. Because of the lack of a settlement of this problem, and because of high ocean freight rates, the prices prevailing in this country, and other contributory causes, purchases will be made by the European countries where their money will go farthest. In order to bring conditions to normal, it was stated, the American exports must be reduced gradually and the imports increased. Only by payment of obligations to this country in the production of goods which the United States can use and by the extension of long-term credits may the trade balance be equalized.

Coal requirements of the European allies are heavy, Italy, of course, being most in need of fuel. Fuel oil, it developed, is to be used to a much greater degree and the increased use of available water power will be tried to solve this phase of the problem. France and Italy particularly are doing much in this line and expect to do more. Progress will stop, according to Mr. Schneider, at the point where electrification, as a result of the harnessing of this natural resource, would be a national liability in the case of any future armed invasion. For this reason, it is expected fuel and waterpower will be used to an equal degree with a considerable greater maximum either way in the case of national necessity.

Foodstuffs, of course, are required, as are chemicals, textiles, shipping, oil, coal, etc. Machinery in large quantities for practically all uses, machine tools, lumber and other recon-

struction materials are wanted and badly. While the restored factories of Europe are expected to furnish much of the materials needed, in order to get the shops and plants back on a completed and operating basis there are some things which must be purchased here. The personal contact of the foreign missions with the delegates to the conference from American business houses already has resulted in some transactions and the arrangement for others, depending upon the finance and credit situation and its developments.

Mr. Schneider was easily the outstanding figure of the allied representatives. It was he who, as the head of the French mission, made the response to the address of welcome by Homer L. Ferguson, president of the chamber of commerce of the United States. It was Mr. Schneider who made the address for all the allied groups in stating Europe's combined needs. It was he who stated France's individual requirements. The esteem in which he was held by his European colleagues was reflected in the reception his statements obtained from his hearers and in the impression of his personality upon them.

Secretary of Commerce Redfield delivered an address that was pronounced by many to be the best of the many he has made in his capacity as a cabinet officer. Norman H. Davis, president of the Trust Co. of Cuba, New York, as the representative of Secretary of the Treasury Glass, delivered what was pronounced an extremely level-headed view of the financial situation. Dwight W. Morrow of J. P. Morgan & Co., literally swept his audience off its feet when he made an earnest plea for the extension of loans to the European allies. The foreign representatives who discussed the financial and economic topics of the conference made profound impressions.

All in all the conference was generally recognized as the first concrete step toward a clear presentation of Europe's real requirements and gave the business men who attended perhaps the best view of conditions short of those obtained by them either first hand abroad or in personal contact with customers in this country. Out of the conference is expected to be reorganized the former international chamber of commerce or some kindred body. The need of constant intercourse commercially between the United States and foreign countries was recognized and with steps under way to effect such a permanent organization and with the creation of a finance committee to continue the study of that problem, the conference adjourned, the foreign representatives to immediately begin a tour of the industrial centers of the United States.

Eugene Schneider, head of the mission and president of the Creusot Steel Works, in an address set forth the situation in the mining and steel industries of France. He said:

Rich in iron ore, but somewhat lacking in coal, France had, before the war, managed to build up an iron and steel industry, not only sufficient for her needs, but leaving a surplus for export.

The mining and steel industries have been severely hit during the war, but no sooner had the armistice been signed than work began again in the devastated regions, where our plants are rapidly coming back to life. Even though the restitution of Alsace-Lorraine does not improve our coal resources, it nearly doubles the production of iron ore, pig and steel, thus enabling France to build up a considerable export trade in this line, and to assume in the world's markets the place that is her due.

In 1913, the production of the French coal mines amounted to 40,000,000 tons. The total consumption was 63,000,000 tons, leaving a deficit of 23,000,000 tons, which came from Belgium, Great Britain and Germany. As regards coke, the prewar situation was also unfavorable, the imports amounting to 3,000,000 tons, about on a par with the French production. Even before the war, France was striving to develop her coal and coke industry; new coking plants had been erected and six new coal mines were to have been opened in the new Pas de Calais basin.

During the war, the production of the coal mines fell 50 per cent, the majority of the pits in the north and Pas de Calais being occupied by the enemy. They were actually the scene of the severest battles. Who does not remember the capture of the Vimy ridge and the battles of Lens?

As I have just said, the production of coal in France fell from 40,000,000 tons to less than 20,000,000, but the strenuous efforts of the mining companies and their men raised the production to 21,000,000 tons in 1916, and 28,000,000 in 1917. At the same time, France harnessed waterpower in order to save coal. France is one of the richest countries in that line. Before the war we had 700,000 horsepower available. Today the figure is 1,200,000 horsepower. Next year it will be 1,500,000 horsepower. Up to now $300,000,000 have been spent in developing waterpower; and during the war alone $120,000,000 were subscribed.

After the war, even with the utmost developments of waterpower we shall be short of coal. When the pits are again in order, the production of France will amount to 45,000,000 or 46,000,000 tons. Alsace-Lorraine produces about 3,000,000 tons, but as she consumes 11,000,000 tons, her return to France, instead of making the problem easier has made it more difficult. The home needs of the country will amount to about 88,000,000 tons. The Saar basin produces 13,000,-

What Allied Countries Want From America

A CONSOLIDATED suvey of the reconstruction needs from the United States, of Belgium, Italy, England and France was presented by the committee on reconstruction supplies. Its analyses of the situation in respective countries based upon reports of the different missions is as follows:

BELGIUM

The Belgians need from us, and principally, first of all, money, then tools, coal, coke, oil, mining machinery, railroad engines, lumber.

They state that because of the unfavorable rate of exchange and because of our higher prices, expensive freights and slower deliveries they probably will be obliged to purchase in Germany goods which they would much prefer to purchase from us.

ITALY

Italy's reconstruction problem is principally agricultural, due to the fact that about 90 per cent of her people are engaged in agriculture. They need agricultural machinery in considerable quantities, also machinery for ditch-digging and grainage work. They also need assistance in the rebuilding of the fisheries industry.

They need coal, oil and a wide variety of lines, in the providing of which the United States should be able to play a most important part. They also need extensive assistance in connection with harbor improvements.

ENGLAND

England, as stated by their reconstruction supplies committee, has no reconstruction problem which they are not fully qualified to take care of themselves.

The problem of housing British laborers was discussed considerably, but without leaving the impression that we were to have any part in its solution.

FRANCE

In general, the French situation as regards industry and commerce is far and away in advance of what is rather generally believed in this country to be the case.

The French committee stressed the importance of proceeding along reconstruction lines which will recognize sound economic principles.

They need, as do Belgium and Italy, money, lumber, machinery, automatic car couplers and railroad signal systems and other improvements in their transportation situation, and a number of lines which under other conditions we might be able to provide, but which as conditions are in most cases would be difficult and in many cases impossible, to purchase from us principally because of exchange difficulties and costly transportation.

000tons, which, deducting its own consumption, leaves a net surplus of 4,000,000 tons. Under the stipulation of the treaty of peace, Germany is obliged to send 20,000,000 tons every year to France to replace the production of the mines she destroyed; moreover, she must deliver to us an extra 7,000,000 tons, which was the average amount she sold to us yearly before the war.

Germany Fails to Deliver

Up to the present we have not even received one-half of the quantities promised to us from Germany, and England has very greatly reduced her coal exports. So we find ourselves faced by an actual shortage of about 20,000,000 tons.

The use of fuel oil must be extended. Before the war, the use in France of the products derived from crude petroleum was limited to gasoline and lubricating oils. Fuel oil we must use in large quantities in future. Large beds of shale exist in the vicinity of Autun. They may be exploited for the production of oil. Beside, Alsace-Lorraine brings back with her the Peschelbrom district with 50,000 tons of oil per year.

However, the old resources of France are insufficient for her needs, and we shall have to import. We are making the necessary preparations. In our ports, tanks have been built with a total storage capacity of 600,000 tons. We have 4000 railroad tank cars; we have under construction 10 tank steamers which will be added to the very small oil fleet we already possess and to the ships we hope to get from Germany.

As regards the production of iron ore, France occupied before the war the second place in the world, and her position in the steel industry was fourth.

The opening and development of the Lorraine district was due to the discovery of the Thomas process and the increase of production has been extremely rapid in the last few years. From 5,000,000 tons in 1910, it jumped to 21,000,000 tons in 1913. Besides, Algeria produces over 1,000,00 tons and Tunis half a million tons. This production left a surplus of 10,000,000 tons available for export.

As regards pig iron and steel, the development of the French industry had been rapid, the increase between 1900 and 1913 being 87 per cent for pig iron and 150 per cent for steel. The domestic consumption had increased in a similar manner, but there was a surplus left for export.

Early in the war, France was deprived of the whole Lorraine district. Eighty-three per cent of her total production of iron ore passed into occupied territory and 9 per cent into the battle zone. Production fell to 2½ per cent at the time of the first battle of the Marne, but rose afterwards to 7½ per cent in 1916 and to about 10 per cent in 1917.

The situation in the steel industry was similar; 81 per cent of the blast furnaces and 65 per cent of the steel works were in the invaded zone or actually under fire. However, the French industry got to work and, during the war, blast furnaces of an aggregate capacity of 620,000 tons, and converters or open-hearth furnaces of a capacity of over 1,500,000 tons were erected.

France, after the war, will take second place in the list of the world's steel countries, following immediately behind the United States. Her engineering industry will follow the lead of the steel industry and will get ready for export business. Plans have already been laid and steps are already being taken for capturing the markets which were formerly in the hands of her enemies. France does not want to compete with her allies in the foreign markets, but she wants to supersede Germany in the countries where German industry had the lead before the war.

A summary of the needs in this line by Belgium, France, Great Britain and Italy was presented by the committee on metals, of which E. A. S. Clarke, president of the Cônsolidated Steel Corp., was chairman. The report follows:

In general the reports showed a greater stability of labor conditions and less menace from social unrest than previous public information had indicated. These discussions also showed that the prospect for the complete re-establishment of industry in those countries is decidedly hopeful, provided supplies of raw materials and goods can be secured. So far as metals are concerned it was disclosed that the requirements for France for the ensuing year are estimated at 100,000 tons of ship plates and 90,000 to 100,000 tons of copper.

The estimates of their requirements submitted by the Italian committee included the following annual quantities over the next five years:

	Tons
Foundry pig iron	200,000
Plates and shapes	60,000
Ingots and semifinished steel and rails	215,000
Scrap iron	100,000
Tin plates	5,000
Copper	15,000
Various other metals	10,000
Total	605,000

There are under consideration in France and Italy plans for extensive electrification of railways, which if put into operation will require considerable additional supplies of copper over those stated.

The Belgian requirements are limited to semifinished steel and copper sheets, but the determination of approximate quantities needed is so dependent upon the rate of restoration of the Belgian works and the supply of necessary fuel as to prevent for the present the making of definite estimates.

The meeting with the British delegation developed the fact that no specific requirements have been formulated, and that Great Britain expects to be able to obtain all the supplies of raw materials necessary for her normal trade, without any special arrangements therefor. The British chairman stated that "the object of America and Great Britain ought to be how best to utilize their outputs for the benefit of the devastated areas. Great Britain has already sent considerable consignments to the continent in the way of metal goods for reconstruction purposes. We expect not only to be able to continue this, but also to increase the quantities."

Consideration of the situation presented by the French, Italian and Belgian committees disclosed the fact that the American industries either have, or are capable of producing surpluses adequate to meet these requirements, provided satisfactory and effective means of financing the transactions involved are arranged. While to a certain degree and in some lines the American industry would be able to take care of a part of these requirements in normal commercial transactions, the aggregate of these requirements involving long credits is so large that, in the opinion of the committee on metals, some special financial machinery must be arranged in order to enable the satisfactory fulfillment of these requirements. In view of the fact that filling these requirements presents a problem beyond the scope of the normal financial machinery, it is the judgment of the committee on metals that some emergency legislation such as is contemplated by the Edge-Ackerman bill now before the congress in Washington, should be enacted. The utilization of such emergency facilities for financing exports would enable the American metals industries to meet Belgian, French and Italian requirements with the greatest possible dispatch and so contribute to the most prompt restoration of normal conditions in Europe.

Belgium's Rehabilitation Sketched

M. Florimond Hanker of the Belgian mission described the reindustrial habilitation which has been brought about up to the present time in that country.

"The damage to steel and iron mills was on such an enormous scale that complete restoration will take a long time," said Monsieur Hanker. "But despite all difficulties, work is being resumed in nearly all remaining factories, plants are being rebuilt and our stolen machinery is being brought back from Germany, Belgian industrial leaders are determined to put their plants back into operation no matter what the cost. Steel production now is 27 per cent of normal and iron production 51 per cent. It would require several hours for me to tell you in detail of the destruction of factories at Liege, Hainaut, Ougree-Marihaye and other places.

"In the matter of coal mines, we suffered less than the French because the Germans preserved our coal deposits for themselves in anticipation of the time that never came when they believed they would have Belgium's seacoast and ports and be able to conquer England.

"Belgian railroads damaged or destroyed during the German occupation are being rapidly repaired and re-established and on many lines schedules are normal. When the armistice was signed 1500 kilometers of railroad had been destroyed. So rapid has been the work of restoration that there remain less than 55 kilometers of unimportant lines unrestored."

Discuss Remedies for Labor Ills

Engineers at Mid-West Meeting of American Society of Mechanical Engineers Believe Study of Workmen and Conditions May Lead to Industrial Peace—Problems of Research and Labor Unrest Discussed

INDUSTRIAL unrest, its causes, effects and suggested remedies, was the subject of much consideration at the joint meeting of the midwest sections of the American Society of Mechanical Engineers at the Claypool hotel, Indianapolis, Oct. 24 and 25. More than 200 members of the Birmingham, Chicago, Cincinnati, Cleveland, Detroit, Milwaukee, St. Louis and Indianapolis sections were in attendance.

The first session was opened Friday afternoon, Charles Russ Richards, dean of the school of engineering and director of the engineering experiment station, University of Illinois, presiding as chairman. In introducing the program, Dean Richards set forth the difficulties confronting American manufacturers today and emphasized the importance of the question to engineers. He said that in the past such problems had not greatly concerned engineers but that in the present day they cannot be ignored.

Maj. W. C. Rogers, vice president and manager of the Employers' association, St. Louis, who presented a paper entitled, "Industrial Unrest," stated that labor can be compared to the human body and, as the body is subject to certain ills and disturbances, likewise is labor. The discussion was opened with an analysis of causes of unrest resulting in the the strikes and lockouts which are lowering the production of the country. These causes may be summed up briefly as the high cost of living, the ostentatious use of wealth, the apparent success of radicalism in its aims elsewhere, class hatred, the influence of of unamericanized immigrants and pernicious Bolshevist propaganda.

Criticizes Present Day Unionism

Although admitting himself to be in favor of the proper type of organization, the speaker stated that he was not in favor of the present trade unionism which caused the recent steel strike and threatens a walkout of coal miners. Speaking of the faults of unions as at present constituted, he said, "I believe in organization and do not hesitate to say that trade unions have contributed in a large way to the welfare of the workers. My criticism of the unions, however, is that they are too faulty in their present organizations. They are antisocial in their attitude toward courts specifically, and in that they set themselves up to the public as a class. They limit production. They place the standard of wages on the low basis of inefficient workmen. They demand the closed shop, which is indefensible from the American standpoint. They habitually violate their agreements and their leaders are frequently untrustworthy, especially where radicals threaten to take control. It would seem that the radicals are threatening the control of all."

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As a remedy for the situation, Major Rogers suggested six essentials to be obtained; the payment of adequate wages to all workers; adoption of the best measures possible for the health and safety of the workers, for proper housing and recreational conditions; the Americanization of foreigners; mediation and arbitration in all industrial disputes; democratization of industry by the establishment of shop committees, internally organized but not in any way connected with unions.

A paper prepared by C. F. Scribner, consulting engineer, Chicago, and entitled "Successful Methods for Improving Human Relations in Industry," was presented by Arthur L. Rice, managing editor of *Power Plant Engineering*. The labor problem is not a theoretical problem but an engineering, academic and economic one, according to Mr. Scribner. The shop should be placed on a piece work basis but only after proper standards of methods, operations and wages have been adopted so as to give the workman a fair living wage and an incentive for maximum production. The rates must be established by the collection of sufficient information to insure their fairness and must not be changed until the conditions under which the rates were first established have undergone some change.

Bonuses Must be Paid on Time

Mr. Scribner also suggested that wages and bonuses should be given the employe in separate envelopes. This offers an incentive for greater production and the man is able to see at once the increase in his earnings by his exerting a little more effort to his output. This payment of a bonus must be made at the due time if it is to have its full influence, for if delayed, some of the workmen may get the idea that the employer is stalling for time in which to doctor his books and decrease the bonus. A promptly paid bonus develops good faith between employer and employe.

"The Results of the Americanization Program Carried Out by the Commonwealth Edison Co.," was the subject of a paper read by A. D. Bailey, assistant chief engineer, Commonwealth Edison Co., Chicago. A short time ago this company undertook to Americanize some of its employes by instituting a school in cooperation with the Chicago board of education and the association of commerce. Although the results have not been remarkable compared to the large number of foreigners employed, the effort has been justified and it is believed that the few who did attend and receive some benefit will have sufficient influence on others to cause a growth in the classes in the future.

In connection with the recent problem of human engineering, Dr. J. A. Watkins, Cincinnati, presented a paper entitled "Industrial Medicine" in which he set forth the results to be accomplished by giving more attention to the physical well being and living and working conditions of employes. He stated that production

can be increased through the efforts of a physician who is employed to study the physical side of labor conditions in the shop, to study sanitary conditions, and further to study living and sanitary conditions in the homes of the employes.

University Gives Important Course

"Training of Students in Industrial Management," a paper prepared by Prof. B. W. Benedict, manager of the shop laboratories of the University of Illinois, received considerable attention. Professor Benedict explained how college students can be taught to manufacture a marketable product while receiving training. The students make 8-horsepower gasoline engines complete in every detail and attempt to produce them on a quantity basis. Each department of the shop, including the machine shop, foundry and the pattern shop is equipped with small offices, tool rooms and production boards as is the commercial shop.

Each student receives training in the details of each operation from the instructor and other students so that as his turn comes, he is able to take up the work in a satisfactory manner. Every operation is timed by a stop watch and his efficiency is calculated as the ratio of the time required for the operation to the standard time set by the department.

The brief discussion after the Friday afternoon session brought out the point that much more attention must be paid to human engineering or, in other words, the workman must be studied more carefully and his work so arranged that he can accomplish the maximum of work without physical strain. J. R. Bibbins, engineer with Blon J. Arnold, Chicago, said he believed a solution of the labor question could be solved by giving more attention and action to housing, transportation and human engineering.

Prof. F. C. Wagner, Rose Polytechnic institute, Terre Haute, Ind., in a brief discussion said that labor has the feeling that it is being exploited by capital and this feeling is due to the fact that labor cannot compute costs. He said further that labor must be educated to figure approximately the costs of finished products in order that they may know that they are receiving justice from the employer. Professor Wagner added that he chooses to define capital as someone else's labor.

Research was the subject of the technical session held on Saturday morning with Prof. A. M. Greene Jr., Rensselaer Polytechnic institute, Troy, N. Y., as chairman. Professor Greene is chairman of the research committee of the society and president of the Society for the Promotion of Engineering Education. The first paper given by Lt. Col. C. F. Hirshfield, director of the research department of the Detroit Edison Co., Detroit, was entitled "General Consideration of Present Status of Research in the Industrial Life of the Country."

R. E. Carpenter, head of the laboratory of the Aluminum Castings Co., Cleveland, in his paper, "Industrial Research, Its Function and Administration," took exception to a paper presented before a Canadian engineering society recently, which maintained that research men should not be taken from that work and placed in other lines of work, otherwise industry would decay. Mr. Carpenter believes that the placing of research men in other lines is advantageous to industry and further recommends that it is desirable to secure as many young men as possible for that kind of work as they frequently possess more enthusiasm than the older men.

Recommends a Central Laboratory

A paper by Louis G. Robinson, Louis G. Robinson Laboratory, Cincinnati, described how a single central laboratory can be made to serve several industrial concerns.

"Present Status of Fatigue of Metals Phenomena" was the title of a paper presented by Prof. H. F. Moore, University of Illinois, who has been devoting much time to the study of this subject. Professor Moore showed a moving picture of microphotographic film of specimens of metal placed in a fatigue or bending machine. This method makes it possible to see the contraction and expansion of the metal as the machine is operated. The development of small cracks and fractures which take place may be traced. Tests have showed that the metal fails from a so-called center of failure. Steel structures have many incomputable stresses and cracks may start from minute scratches on the surface. While cold rolled steel is statically stronger than hot rolled, it has been found that the former stands up no better under the fatigue test. As chairman of the committee on stresses of the national research council, Professor Moore has been given $15,000 to conduct further research along this line.

A new tractor testing plant, constructed at Purdue university, was described briefly in a paper prepared by Dean C. H. Benjamin and Prof. G. C. King and presented by Dean Benjamin. The apparatus, which operates on the treadmill principle, consists of three main parts; the treadmill, a draw bar dynamometer, and a brake or electrical control. The treadmill has been designed so that it is possible to shift the load on the front or rear axles so that conditions similar to service conditions are obtained. Two classes of tests are made with this outfit, one the consumers' test, made in connection with the agricultural experiment station for performance of the tractor, and the other the manufacturers' test which is made in a study of the mechanical construction of the machine.

A paper prepared by George S. Hessenbruch, consulting engineer, St. Louis, and presented by L. C. Nordmeyer, Tait & Nordmeyer Engineering Co., St. Louis, shows how waste material is utilized in St. Louis.

Because of lack of time, Dean J. R. Allen, director of research for the American Society Heating and Ventilating Engineers, gave a brief abstract of his paper which had to do with the experimental work being conducted in heating and ventilating in several laboratories in the country.

At a meeting of the council of the society on Friday morning before the meetings were opened, an appropriation of $20,000 was authorized for the extension and improvement of the society's publication, *Mechanical Engineering.*

Social features of the meeting included a fraternizing luncheon on Friday, a theater party for the ladies during the afternoon, a banquet in the evening and a luncheon at the Indianapolis Athletic and Canoe club on Saturday followed by an automobile trip to the Indianapolis motor speedway to inspect the motor repair depot and to witness airplane demonstrations.

Gives True American Talk

At the banquet W. H. Insley, Insley Mfg. Co., Indianapolis, served as toastmaster. Charles F. Coffin, president of the chamber of commerce, welcomed the society to Indianapolis. The response to the welcome was given by Dean M. E. Cooley, dean of engineering of the University of Michigan and president of the society. The speaker of the evening was Dr. Willis A. Moore, Cleveland, chairman of the national industrial speakers' bureau, who spoke on "Doing the Impossible." Dr. Moore made a plea for more good will in industry and increased production to lower present day costs. Special inspection trips were made Friday and Saturday to a number of industrial plants including those of E. C. Atkins & Co., the Nordyke & Marmon Co., Rockwood Mfg. Co. and the Diamond Chain Co.

Prepare Report on Steel Strike

Senate Committee Will Not Recommend Federal Action Except to Exclude Alien Agitators and Educate Foreign-Born Workers—Pittsburgh Sheriff and Army Intelligence Officer Testify

WASHINGTON, Oct. 28.—A report on the investigation of the steel strike by the senate committee on education and labor will be submitted soon to the senate, the investigation having been concluded last Saturday with the testimony of William S. Haddock, sheriff of Pittsburgh.

Actual results of the investigation in a legislative way are reflected in the Americanization bill which the committee has reported out, and the introduction of measures to deport or punish alien agitators and to make it a crime to advocate sedition. So far as the purpose of the Kenyon resolution calling for the investigation is concerned nothing can be accomplished by the committee. The resolution was designed to determine if federal action in regard to the strike is necssary.

The plans of Americanization and of handling agitators and radicals, whose activities in the strike have developed startling facts, however, promise to bear fruit. The investigation also has given the senate committee a better view of both sides of the case. While it is conceivable the employers may be criticized for certain things, such as the alleged failure to Americanize the workmen, and perhaps for long hours of work in some departments, it is not believed there will be much censure. In view of the testimony of Sheriff Haddock, it seems less likely that there will be harsh criticism of the Pennsylvania state constabularly and other authorities. While some members of the committee recognize thoroughly that many employes prefer to work long hours for extra pay certain ones appear to think the flat 8-hour shift should be put into effect in all departments. It is altogether likely that if the committee took this position, it would be only by way of recommendation and not an attempt to legislate on the subject. It is manifest that the 8-hour day could not be urged in the steel industry without also being made applicable to all industries engaged in interstate commerce.

Would Eliminate Illiteracy

With regard to criticism of strikers, it is believed the committee will vigorously assail some of the leaders and agitators and their radical views, and give strong support of legislation proposed to deal with them. It is thought by some that general deportation might be suggested for aliens, and punishment of native-born agitators. There also is likelihood, it is said, of the recommendation of more comprehensive legislation on immigration to prevent further influx of undesirables to the United States. At the same time, some senators think there already are sufficient laws to handle the entire situation but that they are not being enforced. Evidence given before the committee last Friday appears to support this view.

The committee has reported an Americanization bill designed to eliminate foreign tongues and illiteracy in the United States. This measure, reported by Chairman Kenyon of the committee, has been offered at this time as the result of the investigation of the strike which brought to the attention of the committee the fact that a large number of steel workers are unable to speak English. Senator Kenyon hopes to have the measure enacted at the present session of congress, but it is not certain that this can be done.

Only 5000 Striking in Allegheny County

WASHINGTON, Oct. 28.—Not more than 5000 men are "actually on strike in Allegheny county" and good order is being maintained, the senate committee on education and labor was told last Saturday by Sheriff William S. Haddock, of Pittsburgh, in the course of his testimony concerning the steel strike. Vigorous defense was made by him of his policy of preserving order and denial was made of reports that he had enforced unnecessary restrictions for the suppression of freedom of speech and public assemblage. He presented a formal statement to the committee, which was prepared with the assistance of George J. Campbell, of Pittsburgh, who accompanied him to Washington. Explanation was made by the sheriff of his policy with respect to the prohibition of public assemblages and he declared that restrictions placed on free speech were necessary to preserve peace and welfare of the community.

Bringing copies of official proclamations and correspondence on the subject of the strike and other documents bearing on the death of Fannie Snellings at Brackenridge, Pa., the sheriff told the committee that propaganda is being promoted by strike leaders to discredit the authorities charged with keeping the peace. He exploded the theory of the labor agitators that the death of the woman was due to the steel strike. He defended strongly the state constabulary and his deputies, saying they had adhered and are adhering strictly to the law, and he said charges against both the state constabulary and the deputies were unfounded and should be discredited in every respect.

After outlining the procedure of organization of his forces preparatory to the strike, the sheriff told of the publishing and posting on the night of Sept. 20, two days before the strike began, of a proclamation commanding all local peace officers throughout the county to be on their guard and perform their official duties. Notice was given in populous districts to disperse groups of three or more persons. Care was taken to state that the rights and liberties of the people were not to be interfered with.

"In addition to this I verbally announced that the sheriff would not overrule the local authorities as to public meetings, except that no public meetings were to be permitted or conducted in any foreign tongue," he said. "My reason for this order is that my observation has been in this and other troubles that practically 90 per cent of the offenders against law in matters of this kind are either aliens or naturalized citizens of foreign extraction, who are easily led into attacks upon our government."

Sheriff Haddock said there are in

Allegheny county over 40 members of the Pennsylvania constabulary cooperating with him.

"One of the greatest causes of unrest such as now exists by reason of this steel strike," he said, "is the circulation of wild, anarchistic and unfounded rumors and stories concerning the conduct of the state constabulary, and the deputy sheriff and what happens to those lawless persons who offend and are arrested."

Up to the present, he said, good order has been maintained with but one or two small and unimportant outbreaks, due possibly to relaxation of vigilance on the part of local officers because normal conditions semed to be restored. He attributed this peaceful situation entirely to the earnest co-operation of all peace officers from the policemen to the mayors.

"Yet there is a condition of unrest and uncertainty because of the efforts to enlist men actually at work in the cause of the strikers," he stated. "The agitators are very active and stage every incident they can, such as lawsuits, meeting when permitted, etc., to attract the workingman's attention, but in all the plants of Allegheny county it is doubtful if more than 5000 men are actually on strike. Most all of these are foreign and unskilled labor."

Anarchists at Gary Members of A. F. of L.

WASHINGTON, Oct. 28.—Progermanism, I. W. W.ism, anarchism, socialism, bolshevism, and other nostrums that are hateful to Americanism have been found to thrive in Gary, Ind., Chicago and surrounding territory in connection with the steel strike. Many of those affiliated with the exponents of unamericanism belong to the American Federation of Labor, although not consciously encouraged by the latter organization. Testimony to this effect was given last Friday before the senate committee on education and labor by Lieutenant Donald C. Van Buren, an intelligence officer of the staff of Maj. Gen. Leonard Wood, in command of troops in Gary. Numerous pamphlets, circulars and propaganda tracts, together with statements of men arrested at the beginning of military occupation, were read and submitted to the committee by the witness.

Tons of I. W. W. literature have been found in Gary, he said. Eighteen members of a new local radical body there, Hungarian I. W. W.'s, were rounded up in one night, all of them common laborers who are on strike, and every one of whom belonged to the American Federation of Labor. Some were warned and released and others were recommended for deportation, but immigration officials in Chicago, it was stated, either have refused, because of "lack of conclusive evidence," to have warrants sworn out for them or have taken no action whatsoever. In the case of Ivanhoff and DeGeorge, anarchist leaders, a report was made to the department of justice, which so far has begun no prosecution, the committee was told. Both men, Russians or Austrians, have left Gary. DeGeorge was said to be a chemist who, it was learned, was operating near the Aetna explosive works, near Gary, where guncotton was available from wastes outside of the mills.

"The bible of the 'red,' the anarchist and bolshevist," said Lieutenant Van Buren, "is the manifesto of the communist party of Russia, put out at what is known as the third international meeting at Moscow in March. Many thousand copies of this were in Gary."

Printed by German Publishing House

Lieutenant Van Buren read extracts from this booklet and from other radical literature urging workers to revolt and overthrow the "capitalists" and the government.

"All of the radicals of the country are centering on the propaganda of Lenine and Trotsky," he said. "I call to your attention that fact that the literature was printed in Chicago by the Arbiter Zeitung Publishing Co., which is significant."

Speaking of the Hungarian I. W. W. union, the intelligence officer said many of the members burned their membership cards when troops went to Gary. For the most part, he said, they were ignorant and it is his view that they have been exploited by dangerous leaders. The I. W. W., he said, is sending propaganda to Gary either by courier or by express disguised as merchandise in order to escape the postal laws. The bulk of the literature was said to be printed in either Hungarian or Russian.

The lieutenant told of the socalled Saxon club in Gary, "a German outfit." In this club a sergeant found on the wall a huge, fine German flag, with two small American flags below and at either side of it to make them look ridiculous, the witness said.

"Did the sergeant haul down the German flag?" asked Senator Sterling.

"You may be assured that he did, sir," replied Lieutenant Van Buren. "The German who was in charge protested that the sergeant should also take down the American flags, but the sergeant told him if he opened his mouth again he would run him through with the bayonet. The German kept still."

This club, said the lieutenant, was a branch of the Germanamerican Citizens' league, spelled as here indicated, without hyphen or capital "A" for American. This league, it was said, is headed by a Dr. Gerhardt in Chicago, who was authority for the statement that it has a membership of between 7000 and 8000 in Chicago.

"Its purpose," said the lieutenant, "is to perpetuate German 'kultur' in the United States." It was stated that since the armistice the league has raised its head and is flourishing throughout the Middle West at present. All of its officers, it was stated, were mixed up with the German-American alliance, which congress forced to disband. The German league was said to be conducting a tremendous propaganda. Much of the socialist literature, according to Lieutenant Van Buren, is printed in German and is being distributed and is advocating antimilitarism. The German league, it was declared, will do anything to promote anti-Americanism and is taking advantage of the steel strike to do this.

The intelligence offices said the name of Oscar E. Anderson, who was present at the hearing, headed the list of a Hungarian socialist organization in Gary, and that an I. W. W. official was heard to say that Anderson was the most active I. W. W. worker in Gary. Anderson, born in Chicago, subsequently took the stand and denied his connection with any radical organization, saying he belonged only to the Amalgamated Association of Iron, Steel and Tin Workers, and was on strike. Formerly he belonged to the socialist party, he said, but withdrew from it about one year ago. Anderson served in the United States navy for four years, and his statement to the committee appeared to be entirely straightforward and to disprove suspicions against him. Anderson said that there are not

more than 250 or 300 reds among the 75,000 people in Gary. He asserted that "they don't count."

The intelligence offices said that not one leader of the radicals was American-born, while virtually all of the radicals were declared to be aliens, although some have taken out their first naturalization papers.

The Russian bolshevists, said Lieutenant Van Buren, were more clever than the Hungarians and had started a movement in Gary to organize a Russian red guard army "to overthrow the government," endeavoring to gather recruits from exservice men.

"If 10 per cent of these radicals were wiped out and deported, would it have a wholesome effect?" asked Senator Smith.

"Absolutely, sir," replied Lieutenant Van Buren. "Most of them are so ignorant they are easy prey for exploitation. We would then have the job of making Americans out of those remaining."

"C. E. Ruthenburg, of the communist party of America, out under bond of $20,000, still is spreading red propaganda," he said. "If men like him, Martens, 'bolshevist ambassador,' and Bill Heywood were handled the whole thing would be settled."

Announce New Freight Rates to Germany

Washington, Oct. 28.—New freight rates from North Atlantic ports to Hamburg, Bremen and Danzig, effective Oct. 20, have been announced by the shipping board. The rates on general iron and steel articles are $1.25 per 100 pounds to Hamburg and Bremen, and $1.50 per 100 pounds to Danzig. These include boiler tubes, bolts and nuts, car wheels, wire nails, iron pipe fittings, pipe, 4 inches or less, outside measurement; screws, staples and barbed wire. Other iron and steel and related articles and rates follow, the smaller sums representing those to Hamburg and Bremen, and the larger those to Danzig: Wire netting, 70 cents and 80 cents a cubic foot; hand agricultural implements and agricultural machinery, including tractors, by weight or measurement; aluminum ingots, $1.50 and $1.80 per 100 pounds; ball bearings, $1.50 and $1.80; benzol, special; coke in bags, special; copper bars and sheets, copper ingots, copper wire, rods and coil, $1.50 and $1.80; ferrosilicon, $3.75 and $4.50; lead billets, special; machinery, up to two tons, weight or measurement; monel metal, $1.40 and $1.70 per cubic foot; nickel, $2 and $3; pig lead, special; scrap brass and copper, and silica in bags, $1.50 and $1.80; spelter, special; tin and tin plate, special; vanadium, $1.50 or 1½ per cent ad valorem and $1.80 or 1½ per cent ad valorem; zinc sheets and slabs, special.

Find Constitution Forbids Free Port Zones

Washington, Oct. 28.—Representative Fordney, of Michigan, chairman of the house committee on ways and means, declares constitutional objections stand in the way of legislation to establish free ports for foreign trade in the United States. As a result a number of bills which were introduced to establish zones have been discarded, although hearings already had been held and were proceeding.

The only chance for any such legislation, according to Fordney, is to make all ports free, instead of only a few, as intended. He said the committee had its attention directed to Section 9 of the constitution which provides that "no preference shall be given by any regulation of commerce or revenue to the ports of one state over those of another; nor shall vessels bound to or from one state be obliged to enter, clear or pay duties in another."

Form New Steel and Wire Company in New York

Under the laws of New York state, the Eastern Steel & Wire Co., Inc., has been incorporated with a capital stock of $1,250,000. Fiscal offices have been established at 45 West Thirty-fourth street, New York, and general offices are located at 120 Broadway.

Plans practically have been completed for the erection of a wire mill at Newark, N. J., for the manufacture of special grades of wire, including high carbon spring, nail, annealed, bright, tinned, and coppered market, tinned broom and mattress, and fine weaving wires. Capacity will be approximately 75 tons per day. Plans and specifications covering wire-drawing machinery, motors, nail machinery and other required equipment will be completed within the next 30 days. In the meantime, the company has taken over the plant of the Atlantic Nail & Wire Co., Inc., Newark, N. J., a successfully operating company.

Officers and directors of the Eastern Steel & Wire Co., Inc., are as follows: President, Maxim Karminski, formerly president of the Carbolite Chemical Co., subsidiary of the Tennessee Copper Co., and now president of the Steel Producers' Export Corp., New York; vice president, Thompson W. Decker, treasurer of the Sheffield Farms Co., Inc.; secretary and treasurer, H. Leslie Skinner, formerly director of Shibakawa & Co., Inc.; general manager, E. A. Henry, formerly manager of the steel department of the Vulcan Steel Products Co., New York, and vice president and general manager of the Seneca Wire Mfg. Co., Fostoria, O. Frederick A. Wallis, general agent of the Fidelity Mutual Life Insurance Co., and Arno Geiser, director and secretary of the Max Oscher Co., investment bankers, also are interested.

Limit Orders

In Sulphate of Ammonia Because of Supply—Government Sells Phenol

New York, Oct. 27.—Despite considerable foreign demand for sulphate of ammonia, especially from the Orient, sellers have been forced to restrict new business to relatively narrow limits. This has been due to the great scarcity of supplies, which has developed particularly in recent weeks as a result of the steel strike. At present, sellers are devoting much of their attention to a careful allocation of supplies among contract customers. Prices on sulphate have been tending upward. On export business, $4 to $4.25 eastern seaboard, is quoted. On domestic business, future orders are being figured at around $3.40 to $3.50 producers' plants, and spot at $3.50 to $3.75.

All other coal by-products are unchanged. The demand for benzol at present is not of the volume of a few weeks ago, but the continued curtailment of output has developed a marked shortage of supplies.

The government stocks of phenol, estimated at 30,000,000 pounds a couple of months ago, continue to be marketed at 12 cents, f.o.b. eastern stores. Outside stocks of similar grades are being offered near this figure. Naphthalin is being sold in good quantities.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plant

Pure benzol	$0.25 to .29
Toluol	.26 to .30
Solvent naphtha	.23 to .27

Per Pound at Producers' Plants

Phenol	nominal
Naphthalin, flake	0.06½ to .07½
Naphthalin, balls	0.08½ to .09½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	3.50 to 3.75

Contract

Pure benzol	$0.25 to .29
Toluol	.26 to .30
Solvent naphtha	.22 to .27

Per Pound at Producers' Plant

Phenol	nominal
Naphthalin, flake	0.06½ to .07½
Naphthalin, balls	0.08½ to .09½

Per 100 Pounds Producers' Plants

Sulphate of ammonia	3.40 to 3.50

Wilson Studies New Labor Plans

Failure of National Industrial Conference Leads to Suggestion by Public Group That Whitley System be Adopted—Another Conference May be Organized—Gompers Calls All Union Chiefs to Discuss "Battle" Measures

WASHINGTON, Oct. 28.—Obstinacy of the labor group disrupted the industrial conference last Wednesday. Despite the appeal of President Wilson, written from his sick bed, this group refused to show the slightest signs of compromise. Efforts of President Samuel Gompers, of the American Federation of Labor, a delegate of the labor group, to establish a case in behalf of labor failed.

When Gompers' final resolution concerning collective bargaining was voted down by the employers' group he gave notice in a dramatic speech that the labor group could go no further and would withdraw from the conference. This it did, refusing even to wait and hear proposals from John Spargo, of the public group, in a last effort to maintain the conference intact.

Secretary of the Interior Lane, chairman of the conference, after communicating with President Wilson, asked on behalf of the President that the public group remain in session in an effort to formulate a program to bring capital and labor together. The group remained until Friday night and then disbanded after failing to accomplish anything. In a report to the President, signed by its chairman, Bernard M. Baruch, the group suggested that a commission be appointed to evolve a system of conciliation and arbitration boards, similar to the Whitley system in England.

"In the recognition of the right of organized workers to be represented by delegates of their own choosing," the group stated, "difficulties will from time to time arise. We believe that it would be possible for properly constituted arbitral authority to adjust such differences with justice and fairness to all parties concerned."

The report recommended that a bureau in the department of labor be created to study all forms of arbitration in their practical application and to make report on them.

"We do not believe this group can at this time with advantage further proceed with the discussion of the great questions with which we have been dealing," concluded the report.

Wilson May Take Further Action

It is understood the administration will be urged to take immediate action in the direction of creating an agency which will at least offer federal arbitration to employers and employes. Secretary of Labor Wilson presented a plan to the industrial conference which is said to be under consideration and which met with favor among delegates of the conference. It provides for boards of employers and employes in each industry, with a general board of appeals.

Secretary Lane said that he believed the President would organize a new conference, which would endeavor to bring about a basis for industrial peace. Reports are heard that a new commission on industrial relations may be selected. The old one is held to have done more harm than good, although some claim it was due largely to its personnel, which included some radical organized labor advocates, and was not due to the principles it aimed to develop.

Meanwhile plans of organized labor are proceeding to stage the greatest industrial battle in the history of the country. This is forecast by announcement of Gompers that a conference of the heads of 112 international unions affiliated with the American Federation of Labor would be held in Washington in the "near future" to discuss present and impending disputes. The steel strike undoubtedly will share prominently in the "discussions."

Railroad brotherhoods, farmers' organizations and Canadian laboring organizations will be asked to participate in the conference.

Gompers Sings Swan Song as Closed Shop Fails

WASHINGTON, Oct. 28.—The national industrial conference really broke up because it would not yield to the wish of the labor group that it arbitrate the steel strike. It voted down a resolution to this effect, after E. H. Gary, chairman of the United States Steel Corp., had reiterated with emphasis, as a delegate of the public group, that he would not vote to arbitrate the strike. Then the labor group turned to another device which was meant to bring about arbitration of the strike, as well as to establish principles which it has been upholding since labor became organized in this country. This related to collective bargaining. But it would not support the collective bargaining resolution of either the public or the employers' group. The upshot of the matter was the introduction on last Wednesday afternoon of a collective bargaining resolution by Mr. Gompers reading as follows:

"The right of wage earners to organize without discrimination, to bargain collectively, to be represented by representatives of their own choosing in negotiations and adjustments with employers in respect to wages, hours of labor, and relations and conditions of employment is recognized."

Resolution Was Ambiguous

The public group voted for this resolution. The day previous it had voted against an almost identical resolution. This left only the employers' group voting against the resolution. This defeated it, inasmuch as the unanimous vote of all three groups was necessary to carry a resolution. Delegates of the public group vigorously assailed the attitude of the employers' group and said there could be no harm in adopting the Gompers resolution. But the employers' group maintained that the resolution, in addition to being ambiguous, was in effect the same as the one brought in the day before and voted down both by it and the public group, and which in substance said the right of employes to organize in trade and labor unions is recognized. The employers saw in it an attempt to unionize industry generally regardless of the wishes of the great mass of employes.

Obviously, adoption of this resolution would have given the greatest

moral support to the steel workers committee to bargain with the employers.

It is understood that only one member of the public group voted against the resolution, all of the others who were present voting for it. Judge Gary was not present, having been called to New York. In the employers' group, four members voted for the resolution, insufficient to make a majority, 10 having voted against it.

Tried to Becloud the Issue

Frederick P. Fish, of the employers' group, said that the matter of collective bargaining was interjected into the affairs of the conference to take the place of the resolution on the arbitration of the steel strike for a purpose, and that purpose had clouded the conference throughout.

A. A. Landon, public group, of the American Radiator Co., created a stir when in supporting the resolution, he attacked both the United States Steel Corp., and the steel strike leaders as being public nuisances which should be suppressed. Mr. Gompers then arose and sang his swan song, as he called it.

"The declaration which we have proposed," said Mr. Gompers, "is rejected by the employing group. They want shop organizations, the employers' union. If they can get away with it, why, that is their job. But they are building on quicksand." He said that some day representatives of employers will meet again with representatives of labor, and when they do "the employers will be glad to talk collective bargaining."

Chairman H. A. Wheeler, of the employers' group, making the last speech before adjournment, said the record of that group was before the conference and he proposed to stand by it. The employers' group, he asserted, could not yield on its policy as to collective bargaining without being cowards and cravens. He said the employers' group was ready to continue with the conference and that it refused to take the responsibility for its dissolution.

Employers Explain Results

The following statement was issued by the employers' group after the conference was declared adjourned:

"The adjournment of the national industrial conference, as originally constituted, brings up the question whether the weeks of the controversy over one phase only of industrial relations leaves the situation without a single gain. The employers' group, soberly reviewing the work of the conference, discovers three definite gains:

"1—It has been demonstrated that failure is inevitable where preliminary organization of the elements composing such a conference is absent and where no preparation is made for the orderly presentation of a program which shall include all of the known factors on which industrial relations are based.

"2—Collective bargaining, an accepted and desirable policy in industry, has been brought more prominently before the country and will influence a sincere effort on the part of innumerable manfacturers to find an acceptable medium through which this collective relationship may be secured and maintained in the industrial establishment.

"3—Collective bargaining as a policy or principle, cannot be safely used in the broad and general sense with which the public has been acustomed to express it, but must be defined clearly as to its applicability to the varying conditions of industry and the varying relations that exist between wage earner and the employer.

"Fundamental to the whole question of collective bargaining is the responsibility of those who bargain, and this is directed quite as much at the employer as at the wage earner or the organization of which the wage earner is a member. Only where there is a definite duel responsibility lived up to as scrupulously as is required in other contractual relations can collective bargaining, in any form or under any interpretation, be successful.

"Then it must be remembered that the industrial life of the country in its employment relations divides definitely along certain lines. No one will deny the right of the individual wage earner and his employer to negotiate terms of employment for industrial relations acceptable to both, but aside from this there is the dealing between the employer and his employes by means of the shop industrial council, dealing through a trade or a labor union, and all of these methods are acknowledged and practiced by employers.

"It may be charged that the employers' group in defeating the Gompers' resolution, denied the right of organization and of collective bargaining.

"The purpose of the resolution through cunning phrases coined to carry double meaning was to commit the conference to support the only brand of collective bargaining ever offered by the group presenting it, and the employers were bound to resist to the end.

"The employers' group could not deny the right that it so freely and fully conceded in its own sub-resolution which the conference defeated and it stands today, with the adjournment of the conference, on the record of its substitute and its interpretation, confident that the sober judgment of the American people will come to understand that the position taken was in the defense of the open shop, an American institution that shall not be undermined and destroyed by any organized combination seeking to threaten its life.

"Our social and industrial fabric is not in danger. Employer and wage earner will live and work together, but the conference has demonstrated that the right of the employer to deny representation unworthily sought shall not be abridged; nor shall the right of the wage earner collectively to place before his own employer his needs and his aspirations and his interest in the establishment be abridged.

"We are leaving on the record of the conference this declaration of true American principles and on this declaration the employers' group and the employers of the nation will stand in fair dealing with the wage earner through the critical days of readjustment just ahead."

Union May be Stopped From Soliciting Employes

An employer and an employe may make an agreement that the employe refrain from joining a trades union during the time of his employment, and agents of trades unions may be enjoined from soliciting the employe to join a union, according to a decision of the Supreme Court of the United States. The decision which is of particular interest at this time was handed down Dec. 10, 1917, and may be found on page 229 of volume 245 of the court's decisions. Attention of employers is called to the decision in a letter written by H. W. Flagg, commissioner for the Employing Printers of America. The letter follows:

"The following decision handed down by the Supreme Court, in the case of Hitchman Coal & Coke Co. vs. Mitchell, is of interest to the printing fraternity as well as all other manufacturing businesses:

"It was held that the employer who conducts his business on the nonunion basis may have an understanding or agreement with his employes that they are nonunion and will so continue while in his employment, and that officers and agents of labor unions, having knowledge of such arrangement, may be enjoined from soliciting such employes for membership in the union and from interfering with such arrangement. In other words, an employer has the right to employ only those who are nonunion and who agree to continue nonunion while in his employment, and the employer is entitled in a proper case to have union interference with this arrangement enjoined.

"To secure the benefit of this decision, the employer should have his employes sign cards indicating their clear understanding that the shop is operated nonunion, etc. In the event that the union interferes with this nonunion arrangement, the employer should serve notice of the arrangement upon those union officials, agents and agitators who are interfering with the arrangement between him and his employes. If such interference continues, the employer may ask that it be enjoined under the authority of the above decision without waiting until his place is picketed and until his employes and applicants for employment are intimidated."

Directors of the Taylor-Wharton Iron & Steel Co. have declared the regular quarterly dividend of 1¾ per cent, payable Nov. 1 to stock of record Oct. 24.

Extending Plant

Of Dominion Steel Corp. on Large Scale—To Build Furnaces

Toronto, Ont., Oct. 25.—President Mark Workman, of the Dominion Steel Corp., has announced that plans are being completed for continuing a policy of expansion on a comprehensive scale. The plate mill, now almost completed, is a natural step toward the building of Canadian ships, and he predicted that the time is not far distant when the largest ocean-going vessels will be built in Nova Scotia.

The company has spent nearly $1,500,000 in Newfoundland to increase the output of its mines and quarries, in accordance with the increased requirements of the Sydney plant. New submarine coal mining operations will be immediately undertaken at Bonar Point, on the north side of Sydney harbor. The object is to obtain high-grade metallurgical coal required for the manufacture of the steel to be used in the plate mill. Plans prepared for the new workings involve the expenditure of approximately $2,000,000 and provide for the most modern equipment obtainable.

With the plate mill in operation, the present furnaces will be unable to supply the necessary steel for all purposes, and consequently several new large open-hearth furnaces are to be constructed immediately, having a capacity of about 70 tons each. The present cast house is being enlarged and extended to provide for future needs in this department, in which improved methods will be introduced for pouring the steel into the molds to prevent too quick cooling.

The Dominion Bridge Co., of Montreal, following its decision to manufacture papermaking machinery, has closed a large contract with the Laurentide Paper Co., for an entire set of papermaking machines. This branch of the company's operations will be carried on at its plant at Lachine.

British Columbia mining men believe that they have found a phenomenally large area of exposed iron ore, near the Whitewater river in that province. In the opinion of James A. Hawthornthwaite, of the British Columbia legislature, the discovery of the vast limonite resources in that district has assured British Columbia blast furnaces, rolling mills, and all other accessory enterprises essential to the operation of a great steel plant.

The P. Lyall & Sons Construction Co., Montreal, which some time before the signing of the armistice installed an experimental department to provide against the time when the making of munitions would no longer form a part of its manufacturing activity, is planning to manufacture automobiles.

Pig Iron From $26.25 to $32 in France

Lorraine pig iron containing more than 3.25 per cent of silicon was quoted in France Oct. 5 at approximately $32.50. Pig iron containing from 2.25 to 3.25 per cent of silicon was quoted from $30 to $31.25 and grades containing less than 2.25 per cent were quoted from $26.25 to $29.38. Dollar exchange fluctuated during the week from 7 francs, 80 centimes, to 8 francs, 50 centimes, making it difficult to present exact values, but the average on which the quotations are based was 8 francs.

Hematite was quoted at $48.75 to $51.25 in France, while in Belgium it was quoted at $56.25, the rate of exchange for the Belgian franc being practically the same. Other quotations in France and Belgium follow, the prices being for 100 kilos, or 220 pounds:

	France	Belgium
Shapes	$7.50	$8.50
Rails	8.10	7.81
Sheets, three millimeters	8.75	10.31
Sheets, five millimeters	8.50	.....
Sheets, two millimeters	9.75	.....
Blooms and billets	5.60	.....
Merchant steel	7.50	.....
Galvanized sheets	....	23.12 to 31.25
Steel castings	....	18.75 to 21.25

Obituaries

BERNHARD THEODORE BURCHARDI, vice president of the American Machine & Foundry Co., Brooklyn, N. Y., died Oct. 22, at his home in that city, aged 70. Mr. Burchardi came to this country from Germany nearly 50 years ago. He built the great ocean pier at Palm Beach, Fla., and later constructed the Florida East coast and the Florida West railroad and also the Gulf stream road. Mr. Burchardi became general manager of the American Machine & Foundry Co. in 1902 and designed the building occupied by that company. He likewise was president of the Wahlstrom Tool Co. and was interested in other corporations.

Horace Hudders, secretary, treasurer and purchasing agent of the Aldrich Pump Co., Allentown, Pa., died recently in that city.

Fred A. Larkin, mechanical engineer, and formerly representative of the Allis-Chalmers Mfg. Co., Milwaukee, died Oct. 19, at his home in Brooklyn.

Thomas A. Cain, forman of the die department of the Wiley & Russell division of the Greenfield Tap & Die Corp., Greenfield, Mass., died suddenly in the factory, Oct. 6, aged 63 years. Mr. Cain had worked at the plant 47 years.

James Laughlin Jr., director and member of the executive committee of the Jones & Laughlin Steel Co., Pittsburgh, died Oct. 5, at his home in Zellwood, Fla. He had retired from active participation in the management of the company several years ago and had made his home in Florida for several years.

John H. Tinkham, traffic manager of the Hendee Mfg. Co., Springfield, Mass., died of heart failure at his home in that city, Oct. 11, aged 49 years. Mr. Tinkham had been in the employ of the company for more than 14 years.

W. P. Sparks, who for the past year has been representative at Indianapolis for the Cleveland Milling Machine Co., Cleveland, died Oct. 10. Mr. Sparks was held in high esteem by his friends, members of his firm and by the trade generally.

Alfred Osgodd Blaisdell, designer of the propelling machinery for the monitors used in the Civil war and on the first span of the Brooklyn bridge to cross the East river, died Oct. 22, at his home in Brooklyn, N. Y., aged 87.

Thaddeus F. Woodman, who for the past 30 years has been a director of the Ohio Iron & Steel Co., Youngstown, O., died in that city on Oct. 24, at the age of 72. For 50 years, Mr. Woodman has been identified in business and industrial circles in the Mahoning valley.

Col. Francis J. Regan, president of the J. J. Regan Mfg. Co., Rockville, Conn., one of the foremost citizens and among the most prominent in industrial and financial life in Rockville, died at his home in that city, Oct. 10, aged 58 years. He was quartermaster general on the staff of Gov. Marcus H. Holcomb.

Strike Cripples British Furnaces

Majority in Every District of United Kingdom Blown Out as a Result of Walkout of Trainmen—Mills Also Affected, Although Wages of Iron and Steel Workers Are Increased—Dealing in Pig Iron Suspended for a Time

Bureau of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation Street,
Birmingham, Eng., Oct. 3.

THE iron and steel trades have been reduced by the reckless and selfish acts of the railwaymen to a worse state than existed in any trade during the war. A sham notice was given 24 hours before the strike, making precautions impossible and the strike had scarcely commenced before blast furnaces in all districts of the kingdom began damping down or blowing out.

The effect of the strike will be felt long after its termination. In the South Staffordshire district only a few isolated furnaces are in operation at this date. In all instances where the furnaces are out, the opportunity will be taken to make repairs, and this will mean a fairly long period of idleness, and a short supply of pig iron, limiting operations of finishing iron and steel works. When it is remembered that before the strike the supply of pig iron was insufficient, it will be realized that any extension of the industry to cope with the great demand is out of the question for the present. In the ore mines of Yorkshire 9000 men were thrown out of employment Sept. 29, and an additional 12,000 men in the Cleveland district, 40,000 men at the Tees side steel works, 40,000 in South Wales, 10,000 in Sheffield, and at least 10,000 in the South Staffordshire district. North Staffordshire is particularly affected, as the works there are laid out almost wholly for railroad service. In every district the majority of the blast furnaces are blown out.

The furnaces in South Staffordshire are to some extent assisted in their coal supply by the canals; but this is useless as far as coke is concerned, because all the blast furnaces are dependent on the supply of coke from the North of England, which has to be brought by rail, while the same is true of ore. This accounted for the stoppage of Hickman's great blast furnaces and steel works at Bilston, South Staffordshire, which are fed with ore almost exclusively from the new ore field in Oxfordshire.

There is neither buying nor selling of pig iron at present. Finished iron and steel works are generally stopped, but the South Staffordshire district is a little more fortunate than some others owing to its alternative system of transport by means of canals. Birmingham has a network of canals, served by horsedrawn barges, often scoffed at as obsolete but now of some use. Scores of Birmingham works have been kept going, while the South Staffordshire iron and steel works, especially those which were able to accumulate small stocks of pig iron, kept their forges and mills in operation longer than many of their competitors elsewhere.

Another difficulty at present is due to the impossibility of storing large quantities of finished material, most iron works warehouses being little more than loading wharves. One of the few steel works still in practically full operation is the works of Lord Dudley, at Round Oak, as it is nearly self-contained.

While stopping production, the strike also has arrested the supply of imported semifinished material. A great deal of American steel has arrived at ports, where it must remain until railroad cars can be found to convey it to its destination. Before the strike some finishing mills were in great difficulties for raw steel, and these have been the first to cease operations for lack of material. At present no British steel works is willing to negotiate business for the supply of steel for rerolling purposes, so that the winter outlook is not promising.

The strike is particularly hard on the iron and steel workers whose wages boards have the most elaborate arrangements for discussion and negotiation, in fact, prohibiting stoppage of work. The arrangements have worked so well that for several decades no strike of any importance has occurred.

The bimonthly price ascertainment of selling prices under the Midland iron and steel wages board for July and August has been issued. It provides for an increase of 10 per cent in wages for all classes of iron workers, effective Oct. 5. This is an onerous burden to lay on an industry whose costs of production were increased by a wage advance of 27½ per cent two months ago. It is understood that the ironmasters will not consider any increase in selling prices to compensate them for additional cost, as they consider the trade already is crippled for competition by high prices. They prefer to bear the loss themselves, especially as under the sliding scale they would merely widen the circle of rising prices and wages which for the past two years has proved a handicap to the industry. It is likely that at many iron works a fairly long rest will be taken, whatever be the result of the strike in order that a good start may be made under new conditions.

The railroad strike has completely overshadowed the molders' strike, which still drags on, crippling the engineering works. A great deal of attractive and urgent business is being held up for want of castings. There is no prospect of a settlement, as the molders have not abandoned their claim for increased wages and their employers are more determined than ever to insist that they abide by the agreement under which the wages question was to be submitted this month to the arbitration court in connection with the Engineering and Employers' federation.

Another strike is threatened in South Wales. A number of the men engaged in the tinplate trade have not received the 12½ per cent war bonus and at a recent meeting of the joint industrial committee at Swansea the employers agreed to extend this to the whole of the trade. It is hoped that this may have the effect of averting the strike.

Birmingham tinplate warehouses have been besieged by customers anxious to obtain supplies. Merchants have been taking care of their stock and there has been no difficulty in meeting all demands. Buying is fairly active at the iron warehouses.

British Works Merge

An amalgamation has been effected between Messrs. Cammell Laird & Co., Ltd., and the Midland Railway Carriage & Wagon Co. Ltd., the latter a well known Birmingham wagon building company, according to a British correspondence to THE IRON TRADE REVIEW. It is planned to develop very largely the manufacture of steel railway wagons in connection with which the Midland company has established a large factory in Nottingham, in addition to its concern at Birmingham.

Refractories

Still Moving Slowly, Although Production is Being Kept Up

Pittsburgh, Oct. 28.—The movement of refractories is still extremely limited, as the iron and steel interests are specifying only against such requirements as they must have. Although the steel plant strike is nearly ended in most districts, the gain in working forces has been greatest among skilled workmen and common labor such as used in the unloading and piling of refractories still is scarce. The railroad administration maintains embargoes against the iron and steel works in its efforts to prevent car shortages, and the reason for this policy is said to be the shortage of common labor.

Refractories

(Per 1000 f. o. b. works)

FIRE CLAY BRICK (First Quality)	
Pennsylvania	$36.00 to 41.00
Ohio	36.00 to 38.00
Kentucky	36.00 to 41.00
Illinois-Missouri	30.00 to 40.00
FIRE CLAY BRICK (Second Quality)	
Pennsylvania	$30.00 to 35.00
Ohio	20.00 to 25.00
Illinois-Missouri	25.00 to 30.00
SILICA BRICK	
Pennsylvania	$40.50 to 45.00
Chicago	45.50 to 50.50
Birmingham	46.50 to 51.50
MAGNESITE BRICK (Per Net Ton)	
9 x 4½ x 2½	$80.00 to 85.00
CHROME BRICK (Per Net Ton)	
9 x 4½ x 2½	$80.00 to 90.00
BAUXITE BRICK (Per Net Ton)	
55 per cent.	$ 40.00 base
76 per cent.	100.00 base

Though obliged to pile output quite freely, refractories manufacturers are not cutting down production, which still averages about 60 per cent of capacity. This course is dictated by the belief that present conditions cannot last indefinitely and the possibility of enforced curtailment of output in the event of a strike of the coal miners on Nov. 1 is another factor in the maintenance of production. Prices are unchanged, but are largely nominal in the lack of new business of any account.

Leslie E. Freeman, according to announcement by the American Chamber of Commerce of Brazil, 37 Liberty street, New York, has arrived in this country to open trade relations between the United States and Brazil. Mr. Freeman is equipped with data concerning the markets of Brazil and will supply this information as requested to manufacturers. The chamber is affiliated with the Rio de Janeiro chamber and plans are being made for the publication of a Brazilian-American trade review which is to be printed in this country every month.

Trade Convention Plans Special Features

One of the important features of the Seventh National Foreign Trade convention, to be held at San Francisco, May 15-20, 1920, will be the world conference of American foreign traders, according to preliminary announcements just mailed to American firms represented at previous conventions, who are requested to have their representatives, living or traveling abroad, time their visits to this country so as to take advantage of the valuable opportunities afforded by this convention.

Three special steamers, chartered for the accommodation of delegates from abroad, will be provided for the ports on the Pacific ocean. Another steamer starting from New York, will go by way of the Panama canal.

Information regarding steamer routes, days of sailing and the program of the 1920 convention, is being furnished by O. K. Davis, secretary, National Foreign Trade council, No. 1 Hanover square, New York.

Addresses Foundrymen

H. D. Gates, of the Pangborn Corp., Hagerstown, Md., was the speaker at the regular monthly meeting of the Pittsburgh Foundrymen's association which was held at the Chatham hotel, Pittsburgh, Oct. 20. Mr. Gates' talk which was illustrated by lantern slides, was on "Application of the Sand Blast in General Foundry Work." Carleton S. Koch, president of the Fort Pitt Steel Castings Co., McKeesport, Pa., recently elected president of the American Foundrymen's association, talked briefly on the affairs of the American Foundrymen's association, its problems and aims. He intimated that there was some possibility of the next convention being held in Pittsburgh, provided an exhibition hall of sufficient size could be secured. Seven new applications for membership were presented.

Portable Furnace Burns Kerosene

The device shown in the accompanying illustration is a portable furnace designed to burn kerosene for heating rivets, tools, etc., giving a quick, hot flame. The furnace, which is a product of the Champion Kerosene-Burner Co., Kenton, O., is a self-contained unit with the fuel tank carried on the lower platform of the stand. These tanks are of various sizes, depending on the use to which the furnace is to be put.

Compressed air at a pressure of 90 pounds per square inch forces the fuel to the burner, which is located above the hearth. The fuel is transformed into a gas just previous to being ignited. Air for driving the fuel to the burner is forced into the tank by an air pressure hose or by a pump in cases where an air line is not available. The pressure is recorded by a gage located on the top of the tank.

NEW HEATING FURNACE

It is claimed that the furnace is economical as regards fuel consumption. Tests which were conducted for over a year indicated that with the furnace operating to maximum capacity, the fuel consumed did not exceed ¾ gallon per hour. These tests also showed that the flame gives a heat ranging from 2500 to 3000 degrees, Fahr., burning without any traces of hydrogen. This results in a nonoxidizing flame, which it is stated permits work to be left in the furnace for an indefinite period without danger of its burning up.

As no pipe connections from the furnace to a fuel supply source need be installed, the furnace with the flame in operation, can be lifted by a crane and deposited on another job in close proximity to the work that is waiting.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

WITH $50,000 preferred and $100,000 common stock, the Bossard Railway Signal Corp., Troy, N. Y., has been incorporated to manufacture railway signal equipment of all kinds. It has an exclusive license to market a system of signaling invented by two railroad engineers, Gisbert L. Bossard who is president and general manager of the company, and Rudolf Zaugg, who is its advisory signal engineer and serves on its board of directors. Other officers follow: W. Edward Hamilton, vice president; M. J. O'Sullivan, treasurer; John L. Lehman, secretary. Guy F. Swinnerton is a director and is the company's legal advisor. Mr. Bossard is a graduate in electrical engineering and has been connected with the railway signal equipment and allied industries for about 10 years in an engineering and sales capacity. Mr. Zaugg is in charge of the engineering department of the Federal railroads in Switzerland. Mr. Lehman is a graduate from Union college, Schenectady, N. Y., and until recently was senior inspector of metals at the United States arsenal at Watervliet, N. Y. The company intends to erect its own plant and desires to obtain trade information, catalogs, etc., regarding equipment. Its executive offices are located in the Frear building, Cannon place, Troy, N. Y. Negotiations for representation in England, France and Belgium now are under way. It is reported that over 300 miles of railroad in Europe utilize the signaling system invented by Messrs. Bossard and Zaugg and the company now is preparing plans for the installation of the system on a New York railroad with the object of submitting the system to tests by the interstate commerce commission, safety division.

* * *

ORDERS for complete tinning units for tin plate have been received from France and Japan by the Aetna Foundry & Machine Co., Warren, O.

* * *

COMPLETION of the largest contract in its history recently was achieved by the Weatherly Steel Co., Weatherly, Pa. The contract covered four steel barges for the United States government at a cost of $100,000.

* * *

CONTRACTS from Lacheze et Fils, Dijon and C. Markham & Co., Ltd., Chesterfield, England, for electric furnace installations, have been closed by the Electric Furnace Construction Co., Finance building, Philadelphia.

* * *

THE U. S. Fuel Co. will install a new steel head frame and screening plant, hoisting engine, engine house, concrete boiler stack, boiler room and power house at its Little Vermillion mine near Georgetown, Ill., at a cost of $100,000.

* * *

IN ORDER to care for its increasing Ohio business the J. W. Murray Mfg. Co., of Detroit, producer of auto parts, will establish an assembly plant in Cleveland. The expectation is that this plant will be in operation in about six weeks.

* * *

FOUNDED in 1832, the business of the Charles Parker Co., Meriden, Conn., manufacturer of screws, has grown rapidly. Its latest expansion comprises a 3-story, 50 x 200-foot, concrete addition to its plant. The contract for the construction already has been let.

* * *

THE Hills, McCanna Co., 153 West Kinzie street, Chicago, manufacturer of brass and aluminum castings, recently has acquired a plant at 2025 Elston avenue, Chicago. This plant affords ample space for the expansion of the company's machine shop and foundry.

* * *

IMPROVEMENTS to cost about $200,000 are under way at the north works of the American Steel & Wire Co. in Worcester, Mass. They include erection of an annealing plant, with 16 new annealing outfits, and alterations and additions to other buildings.

* * *

WHEN the Milton Iron Furnace Co., Wellston, O., resumes operation, it will be fully equipped and the plant will be thoroughly repaired. It is erecting a new draft stack, 150 feet high. A new stove also is being added to the blast furnace which will be 85 feet high, its present stove being 75 feet.

* * *

THE National Machine Co., Hartford, Conn., builder of presses and surface grinders, is to purchase the idle brick 2-story factory owned by the F. W. Robbins estate and formerly occupied by the Elmer Tool Co. in Wethersfield, Conn., and will open it within a few weeks, giving employment to 100 persons.

* * *

MACHINE tool specialties will be manufactured by the Sprague-Hayes Mfg. Co., 40-42-44 Leonard street east, Detroit, which recently was incorporated with $10,000 capital. At present the company does not contemplate the erection of a plant. Officers of the company are: President, E. W. Sprague; vice president, Fred Heal, and secretary, R. F. Hayes.

* * *

ON OCT. 6 and 7, 30 representatives from the different offices of the John F. Byers Machine Co., Ravenna, O., held their second annual sales conference at Ravenna. Matters pertinent to the manufacture and sale of the company's auto-crane were discussed and plans for 1920 were formulated. A new model of the crane was demonstrated.

* * *

AS CONTEMPLATED by the A. Garrison Foundry Co., Pittsburgh, its old foundry shortly will be entirely replaced by a new one which will be modern in every respect. One section 95 x 100 feet already is in operation and a section 95 x 120 feet is being added. When the second unit is complete, a third similar to the second will be added, after the remaining portion of the old building is demolished. While the improvements are being made, no loss in production is suffered. Arrangements are expected to be made for a new roll turning shop with twice the capacity of the company's present shop and an extension to its machine shop, likewise is being considered.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

GROUND has been broken at Watervliet, N. Y., for a new plant for the Troy Foundry & Machine Co., Inc., Troy, N. Y., successor to the West Side Foundry Co. The plant will be located on a 25-acre site, opposite the plant of the Troy Malleable Iron Co., which land was purchased by the Troy Foundry & Machine Co. about four years ago. The new building is expected to cost $100,000 and the company purposes to have it completed by Jan. 1, 1920. John T. Starkweather is vice president and general works engineer and will have charge of the construction. Charles A. Sleicher is president and general manager and through his aggressive administration the business has grown so rapidly that this expansion became necessary. Among the large contracts closed recently by the Troy company are one from the Gilbert & Barker Mfg. Co., Springfield, Mass., maker of automatic gasoline tanks, and one from the Sprague Electric Co., Bloomfield, N. J.

* * *

TO CONDUCT a general coal and coke jobbing business as well as to mine coal, the Continental Fuel Corp., Fayette Title & Trust building, Uniontown, Pa., has been incorporated at $25,000. So far the construction of the company's plant has not commenced. The officers follow: President, Frank E. Tuit; vice president, Charles A. Tuit; secretary and treasurer, Paul B. Hickman.

* * *

ACCORDING to an announcement by Vice President and General Manager H. M. Steel, of the Newton Steel Co., Newton Falls, O., the new plant rapidly is nearing completion. It is expected that production of steel will commence by April 1, 1920, and possibly before. It is the intention of the company to employ 600 or 700 men at first and gradually to increase that number.

* * *

AFTER Charles Sorenson, M. L. Bricker, C. R. Brubaker and O. A. Anderson, of the Ford Motor Co., Detroit, had inspected the Ford tractor plant at Hamilton, O., Mr. Sorenson announced that the installation of $1,500,000 worth of machinery is to commence at once and that by the first of next February the plant would be placed in operation, giving employment to 600 men.

* * *

TO PERMIT the better handling of its increased business in high speed steel, carbon tool steel, spring steel, music wire, drill rods, alloy steels, shafting, etc., the Aborn Steel Co., Inc., New York City, has completed its new warehouse and office at 22-24 Clarke street. Other warehouses and offices are located in Boston, Buffalo, Philadelphia, Pittsburgh, Rochester, N. Y., and San Francisco.

* * *

WITH an authorized capital stock of $200,000 the Hudson Mfg. Co., Janesville, Wis., has been organized by Frank B. Strickler and J. C. Strickler, owners of the Strickler Hay Tool Co., and J. E. Cox, also of Janesville. The new concern virtually is a reorganization. The line of hay tools will be enlarged to include farm machinery, barn equipment, etc. Additions to the present Strickler plant will be made at once.

* * *

ARTICLES for religious purposes will be manufactured entirely from metal by the O. N. J. Novelty Mfg. Co., New York, which recently was incorporated with $25,000 capital. The company was chartered by John Jacobs, M. S. Ornstein and A. Ornstein. According to advices from A. Ornstein, who owns the controlling interest in the firm, the company will manufacture its products from a metal of its own composition.

* * *

THE International Earth Boring Machine Co., of Chicago, manufacturer of an appliance designed to be used when mounted on motor trucks for making post holes for transmission lines, fences, etc., has purchased a site for its plant adjacent to the works of the Winther Motor Truck Co., at Kenosha, Wis. This is being done to facilitate the execution of a large order for combination trucks and digging appliances which has been placed by the American Telephone & Telegraph Co., it is reported. The site embraces 17 acres. Details of buildings to be erected have not been issued. Initial construction and plant equipment work is estimated to cost at least $250,000.

* * *

PURCHASED from Oscar Baur by the Fitzsimons Steel & Iron Co., Chicago, manufacturer of cold-drawn steel, etc., 17 acres on Kedzie avenue, between the south branch of the Chicago river and the Chicago & Illinois Western railway at Thirty-third street, will furnish space for expansion. The tract fronts over 700 feet on Kedzie avenue and has a depth of 1300 feet on the railway. It will become the site for a large manufacturing plant equipped with electric cranes, etc., as well as other labor-saving machinery.

* * *

CONSTRUCTION of a new plant for the Sterling Mfg. Co., Cleveland, manufacturer of ammeters and voltmeters, is nearing completion, and is expected to be ready for occupancy within three weeks. The building, which is of reinforced concrete construction, is two stories, 65 x 100 feet, and provision has been made for the erection of another story, if such should be found necessary. In addition to this structure, the company now is planning to erect an office building, 60 x 75 feet, and expects to start construction shortly.

* * *

FOR the purpose of making truck bodies and cabs for selling to the leading truck manufacturers, the Fitz-John-Erwin Mfg. Co., Muskegon, Mich., has been incorporated with $100,000 capital. The company's engineers now are at work on special designs and at present is making commercial bodies and cabs according to specifications furnished by the truck manufacturers. A woodworking plant with about 25,000 square feet of floor space and a site of six acres have been obtained. President H. A. Fitz John formerly was production manager of the Continental Motors Corp., and later, directed the purchases of the Dayton Wright Airplane Co. W. C. Powell is vice president; L. B. Erwin, secretary, and T. H. Hume, treasurer.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

TRUSTON P. DRAPER, who has been appointed general superintendent in charge of operations in all of the properties of the Sharon Steel Hoop Co., Sharon, Pa., succeeds George W. Short, who recently resigned. Mr. Draper is an operator of broad and general experience. He was graduated from Yale university in 1903 and immediately entered the steel business in Youngstown, O., being for some years with the Republic Iron & Steel Co. in various capacities in its blast furnaces, steel plants and rolling mills. In 1906 Mr. Draper became affiliated with the Inland Steel Co., at Indiana Harbor, as assistant general superintendent. He then returned to the Youngstown district as assistant superintendent of blast furnace and steel departments of the Youngstown Sheet & Tube Co., where he spent a number of years. Until recently, for about two years past, he has been identified with the Trumbull Steel Co., Warren, O.

Edward O. Werba has become affiliated with the Meriden Iron Co., Hibbing, Minn.

W. H. Schoen recently was elected president of the Pittsburgh Knife & Forge Co., Pittsburgh, succeeding P. A. McBride.

Maurice Kenyon has resumed his duties as purchasing agent for the New Departure Mfg. Co., Bristol, Conn.

K. K. Hood of the American Zinc Lead & Smelting Co., has been transferred to the American Zinc Co., of Tennessee, at Mascot, Tenn.

Charles H. Schmalz who recently resigned from the Hanna Engineering Works, Chicago, has become assistant factory manager of the Holt Mfg. Co., Peoria, Ill.

C. W. Cross, has been appointed by the Chicago Pneumatic Tool Co., Chicago, as manager of western railroad sales with head quarters at Fisher building, Chicago.

H. G. Hilton, who has been identified with the United Furnace Co., Canton, O., now is connected with the Steel Co., of Canada, Hamilton, Ont.

Phillip L. Getzinger, formerly with Edgar Allen & Co., recently was made manager of the Chicago branch of the Vulcan Crucible Steel Co., with offices at 16-18 South Clinton street, Chicago.

J. B. Throckmorton has been appointed to have charge of the New England district for the Lyon Metallic Mfg. Co., Aurora, Ill. His headquarters will be in the new branch sales office established at 161 Devonshire street, Boston.

B. F. Harper, formerly connected with the sales organizations of the Republic Iron & Steel Co. and the Ft. Wayne Rolling Mill Corp., Fort Wayne, Ind., has associated himself with Roland T. Meacham, Guardian building, Cleveland, investment broker.

Hugo Ritter Von Wessely, vice president and treasurer of the Rowe Calk & Chain Co., Plantsville, Conn., has resigned and will return to Austria, where his mother resides. Mr. Von Wessely has been with the company eight years and was in charge of its western sales office in Chicago.

S. W. C. Fitts, for the past two years superintendent of the Worcester Stamped Metal Co., Worcester, Mass., has resigned to accept a similar position in Los Angeles. He is succeeded by Victor Carlstrom, who comes from the Wire Wheel Co. of America, Buffalo.

Harry E. Figgie recently became sales manager for the Perfection Spring division of the Standard Parts Co., Cleveland, succeeding W. P. Culver, resigned. For the past few years, he has been sales engineer at that plant, prior to which he was assistant superintendent.

F. J. Buller resigned recently as treasurer of the Canadian National railways to accept the position of vice president and manager of the Canadian Steel Tire & Wheel Co., which will establish a large plant for the manufacture of locomotive and passenger car wheels at Montreal, Que.

Joseph H. S. Lynde, for the past 20 months supervising and safety service engineer for the Worcester Pressed Steel Co., Worcester, Mass., has resigned to accept a position of greater responsibility with the American Tube & Stamping Co., Bridgeport, Conn., Mr. Lynde formerly was a district engineer for the Westinghouse Machine Co., Pittsburgh.

George W. Goethals, builder of the Panama canal, has been elected president of the American Ship & Commerce Corp., New York, which recently was organized as a combination of the Wm. Cramp & Sons Ship & Engine Building Co., and the Kerr Steamship Co. Kermit Roosevelt, son of the late ex-president Theodore Roosevelt, is secretary for the corporation.

F. M. English has been appointed district sales manager in charge of the sales office recently established in Pittsburgh by the Reading Iron Co., Reading, Pa. R. A. Griffin is district sales manager in charge of the new Chicago branch sales office. Craig Geddis has been appointed advertising manager for the company and W. E. Dunham is production manager.

E. C. Morse, former assistant director of sales of the war department, Washington, has been made director of sales following the resignation from the latter office of C. W. Hare. Mr. Hare also was assistant director of munitions, but no successor to the latter office will be named. It was announced by Secretary of War Baker that the resignation of Mr. Hare was due to an indisposition which prevented his personal participation in the activities of his offices.

George S. Hewins, who has been general manager in the construction of ships for the United States shipping board at the yard of L. H. Shattuck, Inc., Portsmouth, N. H., since the United States entered the war has become general engineer in charge of construction of the system of the New England Power Co., with headquarters in Worcester, Mass. He succeeds Col. George W. Bunnell, who was president of the Power Construction Co., a subsidiary and who resigned last month to go to Santo Domingo, West Indies, as general manager of the Barahoma Co. At the outbreak of the war Mr. Hewins was engaged as chief engineer for the British Chemical Co., Trenton, Ont.

Men of the Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

GUY E. TRIPP, chairman of the Westinghouse Electric & Mfg. Co., East Pittsburgh, has been elected a director of the American International Corp., succeeding J. Ogden Armour. Mr. Tripp was one of the original directors of the American International Corp., but resigned upon entering the ordnance department of the army. He has been chairman of the Westinghouse Electric & Mfg. Co. for more than seven years.

H. W. Ross has been elected vice president of Templeton Kenly & Co., Ltd., Chicago, manufacturers of jacks.

L. A. Muttart has been made manager of the Chicago railroad sales department of the Western Electric Co., Inc., Chicago.

Edgar Reed, president of the Reed & Prentice Mfg. Co., Worcester, Mass., who has been on a three months' business trip to Europe, sailed for home Oct. 16.

Carl F. Dietz, sales manager of the Norton Co., Worcester, Mass., has left for Europe to look after the personnel and sales methods in France, Belgium, Germany and England.

William H. Savage, builder of machine tools, and Everett E. Wilbar, assistant treasurer of the Union Foundry Co., both of Fitchburg, Mass., are among the incorporators of the People's Trust Co., of that city.

Olof Ostlin, superintendent of the Bolinger Co., Ltd., Stockholm, Sweden, builder of crude oil engines, accompanied by P. Kindberg, a mechanical engineer of Stockholm, are in this country buying machinery.

James A. Carr, president of the American Seeding Machine Co., has been made a chevelier of the Legion of Honor of France for his services as business manager of the allied purchasing committee in Washington during the world war.

J. H. Deppeler, of the Metal & Thermit Corp., has been elected a vice president of the American Welding society, and P. F. Willis, president of the Henderson-Willis Welding & Cutting Co., has been elected a director of the society.

R. M. Dravo, of the Dravo-Doyle Co., Pittsburgh, and who was chief of the Pittsburgh district ordnance office during the war, received the distinguished service order medal from the war department last Friday in Washington.

Walter McCrum, who recently resigned as assistant manager of the Clark Electric Mfg. Co., Middletown, Conn., has accepted a position with the Haytian American Corp., which controls the electrical output of the island of Hayti, West Indies, and has left to take up his new duties.

Col. W. A. Starrett, who served throughout the war as chairman of the emergency construction committee of the war industries board in Washington, has been elected a vice president and director of the George A. Fuller Co., general contractor, New York, Boston and elsewhere.

R. Sanford Riley, president of the Sanford Riley Stoker Co., Ltd., Worcester, Mass., arrived in New York, Oct. 17, on the ADRIATIC after a two months' European trip in the interests of his own company and also the Norton Co., Worcester, of which he is a director. He returned to Worcester this week.

Arthur E. Barr has been appointed employment manager of the Heald Machine Co., Worcester, Mass., to succeed Harry W. Cobb, resigned. Frank Greiner, who has been with the Heald company for three years, has resigned as chief service engineer. L. C. Kenyon, who has been handling its New England territory for the past two years is to be transferred to Chicago to assist G. A. Pabst. He will be succeeded by M. F. McCormick, formerly with the Sperritt & Stoer Co., Philadelphia.

Albert H. Zimmerman, who for 14 years has been affiliated with the Continental Motor Co., Detroit, recently was made vice president, treasurer and general manager of the Supreme Motors Co., Warren, O. Mr. Zimmerman is 36 years old and began his business career as auditor and factory accountant for the Continental company. At that time the factory output was about 100 motors annually and this since has grown to 160,000. In 1912 he was made secretary and treasurer and a member of the board of directors as well as of the executive committee. He resigned in 1918 to take a much needed rest.

George H. McDade recently became affiliated with the Pratt & Whitney Co., Hartford, Conn., maker of machine tools and small tools, etc., in its main office. He has had a wide experience along mechanical lines and as a shop executive. He served as an apprentice and journeyman first with the Allentown Foundry & Machine Co., Allentown, Pa., and the Allentown Wire Co. Later he was chief inspector in charge of the time setting for the Bethlehem Steel Co., and became superintendent of the crane department at Philadelphia for the Niles, Bement, Pond Co., serving from 1901 until 1906. Special work for the Westinghouse Electric & Mfg. Co. took up the next four years and he then in turn became superintendent of the automobile department of the Flint Wagon Works; master mechanic of the engine department of the Buick Motor Co.; engine shop superintendent with the Hudson Motor Car Co., Detroit; factory manager with the Northway Motor & Mfg. Co., that city, and then back to Flint, Mich., to do some special work for the Buick company.

Charles W. Forcier, who for the past three years has been purchasing agent of Mackintosh, Hemphill & Co., Pittsburgh, recently resigned and has opened offices in the Union Arcade building as a sales engineer, in which capacity he will represent in western Pennsylvania, West Virginia and eastern Ohio, the Crucible Steel Forge Co., Cleveland, and the Exeter Machine Works, Inc., with a plant at Pittston, Pa., and executive offices at 30 Church street, New York. Before becoming identified with Mackintosh, Hemphill & Co., Mr. Forcier was with the Pittsburgh Railways Co. in the capacity of storekeeper. He has been treasurer of the Purchasing Agents' association of Pittsburgh for the past two years and will retain this position until the annual meeting of the association next month. Frederick K. Acker, who has been assistant purchasing agent of Mackintosh, Hemphill & Co., Pittsburgh, has been promoted to the position of purchasing agent, succeeding Mr. Forcier.

U.S. Exports Excess Is Dwindling

September Foreign Trade Figures Show Unprecedented Imports and Slightly Smaller Exports—Shipments to Nonallied Europe Up 400 Per Cent and to Allies But 6 Per Cent, Records Show—General Financial News

BY JOHN W. HILL, FINANCIAL EDITOR

EXPRESSIONS of sentiment at the international trade conference at Atlantic City last week and the Manufacturers' Export association in session in New York the week before, that a restored equilibrium for world trade and upset foreign exchange depended upon increased imports and diminished exports for the United States, were echoed in the report of September exports and imports given out by the bureau of foreign and domestic commerce.

In it, American shipments abroad were seen to have declined 8 per cent while imports increased 28 per cent. Exports for September were valued at $593,000,000, a drop of $53,000,000 from the August total and of $335,000,000 from the June high record. In September of 1918 the exports were $550,000,000. It is interesting to note in this connection that England's exports for the same month exceeded those in August by $131,000,000 and those in September of last year by $304,000,000, all of which indicates the success that is attending the herculean efforts Great Britain is putting forth to recapture her foreign markets. Of the $1,009,000,000 increase in British exports for the nine months of the year, however, only $168,000,000 have come to the United States, the remainder representing sales to other parts of the world.

The fact that the September excess of exports for the United States was $158,000,000, which is smaller than any September since 1915 and less than any export monthly export balance since that date but two, is due to the advance in imports rather than the fall of exports the record shows. Imports last month attained the unparalleled figure of $435,000,000. This is $92,000,000 higher than the previous record established in June of the present year. The high level before the war was $184,000,000 for June, 1913. Only a portion of the increase over this figure can be accounted for by inflated prices.

How normal laws are working steadily toward the end of reducing this country's excess of exports and bringing the current foreign trade situation more into balance, with a consequent recovery in the exchange rates, is revealed in monthly record of trade balances for the year. The excess of exports for September of $158,000,000 is at the rate of $1,896,000,000 annually, as compared with the excess for January of $409,560,000 or at the annual rate of $4,908,000,000. How the excess is being hammered down, more by greater imports than by smaller exports, is disclosed in the following table, the last 000 being omitted from the figures:

	Exports	Imports	Excess exports
September	$593,000	$435,000	$158,000
August	646,258	307,331	338,917
July	570,082	343,999	226,083
June	918,252	293,069	625,183
May	604,896	328,927	275,969
April	714,513	272,956	441,557
March	604,912	267,588	337,324
February	585,097	235,171	349,926
January	622,552	212,992	409,560

Although it may seem strange that the exports remain so high despite the drastic exchange rates, a study of the destination of shipments clearly shows the effect of depressed exchange. Increased sales to Europe have gone to neutrals and to the central powers, rather than to England, France and Italy where especially in respect to the last two the exchange premium is next to prohibitive. Exports to the neutrals have increased approximately 400 per cent, or from $206,000,000 to $1,009,000,000 for the first eight months of the year while those to the allies have advanced but 6 per cent or from $2,329,000,000 to $2,488,000,000. For all of Europe exports have increased 41 per cent during the period and for the rest of the world 28 per cent.

How exchange rates are affecting exports to Italy where the premium on the dollar is 48 per cent is seen in the 21 and 31 per cent drop in imports from America for July and August respectively, while in France where the premium is 40 per cent the decrease was 37 and 28 per cent, respectivly, for the same months. Sales of 57,000,000 have been made to the Teutonic allies this year.

It is certain that the allies will not buy any thing but indispensable material in this country but even this will amount to a huge total, according to estimates made at the trade conference last week. Much steel and other materials will be needed to the extent, it is computed, of $2,750,000,000 before next summer. Secretary Redfield, at the conference, advocated the formation of a $500,000,000 foreign financing corporation to extend the credits necessary to make the exports possible.

The importance of keeping additional credits at a minimum and of pushing export trade in other parts of the world outside of allied Europe is made apparent when it is realized that the ultimate debt Europe will owe this country will probably reach $14,500,000,000, of which more than $10,000,000,000 will represent government advances and the remainder private loans previously extended together with those to be made to finance reconstruction.

Reporting out by the house committee last week of the Edge bill recently passed by the senate, brings the financing corporation project one step nearer. The first big foreign financing move since the armistice was made last week by J. P. Morgan & Co. in offering $250,000,000 British loan. Although foreign representatives at the Atlantic City conference were pledged the financial support in reconstruction, the success the British loan meets at the hands of investors will be the real index to future plans in this direction.

Great activity of the stock market characterized by advances of steel shares last week attracted much attention. On one day Republic Iron & Steel gained over 16 points. A part at least of the advance was believed due to the belief that the Supreme court would decide that stock dividends are not income and not taxable as such in the Towne case now before it. Arguments have been presented and the decision is due within a few weeks. A number of steel companies are known to have stock dividend declarations under contemplation and, provided the case is decided satisfactorily, distributions will be made.

Bethlehem Buys Elkins Coal & Coke Co.

Directors of the Bethlehem Steel Corp. at their meeting Oct. 23, an-

nounced the purchase of the Elkins Coal & Coke Co., a West Virginia corporation, owned and operated by the heirs of the late Senator Stephen B. Elkins. With respect to the purchase, the Bethlehem Steel Corp. announces:

"The property consists of 46,000 acres of coal land in West Virginia, with coal reserves of more than 150,000,000 tons. The property is equipped and developed for an annual output of 1,500,000 tons of coal, which will be increased to 3,000,000. Acquiring of the Elkins company by the Bethlehem interest, in conjunction with their present sources of supply, provides the corporation with its full requirements for coking, heating and steam coal.

"The shipbuilding plants of the corporation are operating at full capacity with no diminishing of orders on hand. New business is being booked at a rate in excess of billings.

"The steel plants, other than the rail mills, are running at full capacity, with an increasing volume of new business offering. The railroad buying is still below normal, but general commercial lines are rapidly filling the capacity usually operating on railroad orders.

"The corporation is continuing its program of extensions and additions to plants, having spent to date this year over $15,000,000 for new construction. A number of new plants are just now coming into operation and over the next five months a material increase in capacity will become available."

Pullman Earnings Under U. S. Control Less

Net profits of $12,730,057 were earned by the Pullman Co. during the year ended July 31, as compared with $13,402,205 for the previous, the annual report of the company shows. The operations of the company were under government control during the period and provisions for depreciation is missing from the income account. It is explained that this item accrues under the contract with the director-general. The company's compensation under federal operations has dropped off enormously. The financial position, however, is strong, with quick assets of $59,392,837 and net working capital of $30,844,743 against a net working capital of $21,169,743 in 1918.

The balance sheet of the corporation shows a loss of 94 cars and equipment, but the valuation was listed only $107,450 less. Securities held increased $600,000, while bills and accounts receivable grew from $3,629,577 last year to $10,423,721 in 1919. Accounts payable, however, expanded from $2,946,925 to $5,017,506. Total assets showed a gain of around $11,000,000 to the total of $171,254,870. Following is the comparative consolidated income account:

	1919	1918
Rev. from cars	.....	*23,287,251
Fed. comp.	$11,750,000	†6,854,166
Ret. from mfg. inter., etc.	3,689,935	3,216,761
Gross income	$15,439,935	$33,358,178
Expenses and taxes	2,709,878	‡17,348,081
Depreciation	§.....	2,607,891
Balance	$12,730,057	$13,402,206
Dividends	9,599,792	9,599,792
Surplus	$3,130,265	$3,802,414

*Revenues from earnings of cars for five months ended Dec. 31, 1917.

†Federal compensation, seven months ended July 31, 1918.

§Provisions for depreciation during federal control accrues under the contract with director-general of railroads, and does not appear under expenses in income account.

‡Includes operating expenses, repairs of cars, taxes, and insurance for five months, amounting to net balance $13,646,027, and corporate expenses and taxes for seven months ended July 31, 1918, amounting to $3,664,666, the latter amount also including items of expense and taxes prior to Jan. 1, 1918.

Form New Export Concern

A statement just filed with the federal trade commission gives the details of the organization of the Namusa South American Corp., under the Webb Pomerene law for the purpose of exporting chemicals, agricultural implements, construction materials, hardware, machinery, machine goods, mill supplies, scientific and industrial implements, silverware and metal goods, etc. The plan of organization provides for $50,000 common stock par value $100, of which $3900 has been issued; 500 shares no par value authorized, issued at $100 a share, and a capital of $2500 to begin with.

Officers of the company are: President, R. H. Fullerton; vice president and treasurer, O. P. Hollander; secretary, E. F. Tompkins. Among the directors listed as W. H. Cowdery, chairman of the board, who is also president of the American Fork & Hoe Co., Cleveland; Albert C. Lehman, president of the Blaw-Knox Co., Pittsburgh; H. Read, president of the Read Machinery Co., Inc., York, Pa.; and Dr. Edward Weston, president of the Western Electrical Instrument Co., Newark, N. J.

Among the companies holding one or more shares of stock are the American Fork & Hoe Co., Cleveland; Bethlehem Fabricators, Inc., Bethlehem, Pa.; Blaw-Knox Co., Pittsburgh; Excelsior Hardware Co., Stamford, Conn., Read Machinery Co., Inc., New York; Rowe Calk & Chain Co., Plantsville, Conn.; Urschel Valve Mfg. Co., Toledo, O.; and the Western Electrical Instrument Co., Newark, N. J.

Curtiss Assets Decline

Total assets of $16,072,220 are reported by the Curtiss Aeroplane & Motor Corp. in its annual statement for the year ended June 30. This represents a shrinkage from the total of $24,343,054 at the end of 1918. A reduction from $6,484,600 to $610,540 is reported for the inventory account. Accounts and notes payable are reduced from $4,907,873 to $254,229.

Cash on hand compares $2,858,390 with $669,238 last year, while accounts and notes receivable show a falling off from $7,503,404 to $2,740,744. The reserve for taxes is $700,000 less, at $500,000. The profit and loss surplus stands at $2,271,020, against $681,095 at the close of 1918.

The company is retiring 5369 shares of its preferred stock at 110 and the accrued dividend, in accordance with sinking fund provisions, and it has extinguished its funded debt of $4,788,235. The company owes $4,000,000 to the United States government on account of advances on war contracts, but this will be liquidated when these contracts are settled. A bill has been introduced in congress to settle the government's contracts with the company at $6,114,126 and purchase the Buffalo plant of the corporation.

Financial Crop Ends

THE Spicer Mfg. Co., South Plainfield, N. J., has purchased the Parrish Mfg. Corp., with plants at Detroit and Reading, Pa., makers of automobiles, trucks, frames, and the Sheldon Axle & Spring Co., Wilkes-Barre, Pa. The authorized capital will be $2,000,000 preferred stock; $5,000,000 common stock; $3,000,000 surplus and $3,000,000 one to five year serial 6 per cent notes which have been purchased by the company's bankers.

* * *

A favorable vote to increase the capital stock from $1,500,000 to $2,000,000 has been taken by the stockholders of the North & Judd Mfg. Co., New Britain, Conn. The proceeds will finance the W. & E. T. Fitch Co., New Britain, which the company recently acquired.

* * *

A new organization which it is said will include 90 per cent of the safety razor business of the world, has just been affected in Boston. The consolidation involves the Gem, the Ever-Ready, and the Star Safety Razor companies. The new company will be known as the American Safety Razor Co. with an authorized capital of $20,000,000.

Prospective Tool Business Large

Closings at Present Represent Many Small Tools and Much Light Equipment—Large List Out From General Electric, American Car and Foundry and Chevrolet Motor Companies—Sizable Crane Business Pending

MUCH space is being taken up in order books of machine tool and equipment sellers today, although the aggregate value is not surprisingly large. This is by reason of the fact that most of the sales made are for light equipment or for small numbers of small tools. Answers to the numerous inquiries being received are taking much of the dealers' time and in some cases mean working after regular hours. This prospective business looms large, however, and presages well for the late fall and winter months. While it is probable that a coal strike will affect the machinery market somewhat, the fact that the steel strike practically has fallen through promises to produce much equipment business at an early date.

Sizable orders at times interrupt the continuity of the smaller ones in practically all districts. Lists issued by the General Electric Co., Schenectady, N. Y.; American Car & Foundry Co., New York City, for shops at Depew, N. Y., Buffalo and Chicago; Chevrolet Motor Co., Bay City, Mich., aggregate about $100,000 worth each. A large list is expected from the Willys Corp., which is enlarging its Elizabeth, N. J., plants, involving an expenditure for buildings and equipment of about $4,000,000. Much special machinery will be bought. The company recently purchased 10 special machines. Other buyers, prospective and actual, include the J. H. Williams Co., Brooklyn, N. Y., manufacturer of drop forgings; S. P. Townsend & Co., Orange, N. J., manufacturer of lawn mowers, etc.; Empire Axle Co., Dunkirk, N. Y.; American Motors Co., Plainfield, N. J.; E. W. Bliss Co., Brooklyn, N. Y., for Hastings, Mich.; Ellis Motor Car Co., Newark, N. J.; H. H. Franklin Co., Syracuse, N. Y.; Nash Motors Co., Milwaukee, Wis.; Samson Tractor Co., Janesville, Wis.; the Stromberg Motor Devices Co., Chicago, and a large number of automobile manufacturers in Detroit, including Dodge, Hudson, Ford, Cadillac and Packard.

Railroad purchases of machinery requirements slowly are taking form and further legislation looking toward the return of the railroads to private ownership seems an early possibility. Against such action railroad purchasing agents are lining up their 1920 requirements. The Santa Fe railroad has made some minor purchases already but most of the inquiries are tentative. These include some from the Pennsylvania lines west and the New York Central. The Stark, O., shops of the former road are said to be ready for machinery but many purchases yet have to be made. One steel fabricator in the Chicago territory bought $12,000 worth of tools. In that district there seems to be a large demand for sheet metalworking machinery with a consequent lack of punch presses.

Some slight stir exists in the eastern crane market. The American Car & Foundry Co. wants five cranes for Chicago and three for Buffalo. The Kennedy-Van Saun Mfg. Co., New York, wants seven cranes of various sizes. The Newton Machine Tool Works, Inc., Philadelphia, wants electric cranes, as does the Empire Axle Co., Dunkirk, N. Y. The Harley Co., Springfield, Mass., wants four and the Midvale Steel & Ordnance Co. is reported to be in the market for a like number for Johnstown, Pa. Three cranes are wanted by the Leffel Mfg. Co., Springfield, O. The American Tube & Stamping Co., Bridgeport, Conn., wants a traveling crane and a gantry crane is wanted by A. Bentley & Son, Toledo, O.

Past Month Has Been Active for Eastern Sellers

OCTOBER, now closing, is regarded by the eastern machine tool trade as one of the most satisfactory months so far this year. Inquiry has been well in excess of several of the preceding months, and buying has been of good volume, for in addition to several sizable orders, there has been considerable small miscellaneous business. Possibly the most significant development has been the interest displayed by the automotive and allied industries. This has been manifested in the Middle West for sometime past, but not until recently has it been in evidence in the East. The biggest inquiry, however, to come out from these sources, that of the New Departure Mfg. Co., Bristol, Conn., continues pending.

Other branches of industry are also represented by sizable inquiries. The General Electric Co., with the addition of a list just issued, is in the market for approximately $100,000 worth of equipment for its Schenectady, N. Y., plant, and is expected to bring out another list within the next few days. Another large inquiry is that of the American Car & Foundry Co., 165 Broadway, New York. Machine tools aggregating a similar amount are desired for its plants at Buffalo, Depew, N. Y., and Chicago, in addition to considerable fabricating equipment. The E. W. Bliss Co., Brooklyn, N. Y., continues in the market for machine tools for its plant at Hastings, Mich., already having placed some business. The J. H. Williams Co., manufacturer of drop forgings, also of Brooklyn, N. Y., has been a buyer of the past week.

A large list is expected shortly for the Elizabeth, N. J., plant of the Willys Corp. Plans have been completed

Consistently uniform—

From ingot to finished product, *uniformity of quality* is the hobby of the Ludlum Plant. No matter what brand you select you will find it *consistently uniform.*

MOHAWK EXTRA	**POMPTON**	**HURON**	**TETON**
High Speed Steel	Carbon Tool Steel	Alloy Die Steel	Ball Bearing Steel
ALBANY	**ONEIDA**	**YUMA**	**SEMINOLE**
Alloy Tool Steel	Oil Hardening Steel	Chrome Magnet Steel	"Foolproof" Chisel Steel

Prompt shipments from our warehouse stock at Watervliet, N. Y., Detroit, Mich., Chicago, Ill., or Cambridge, Mass., handled through our Branch Offices.

LUDLUM STEEL COMPANY, General Offices and Works: WATERVLIET, N. Y.

Branch Offices: Chicago, Cambridge, Mass., Detroit, Buffalo, New York City, Cincinnati, Cleveland, Philadelphia, Pittsburgh

for additions, estimated to cost, equipped, around $4,000,000. It is believed that purchases will involve much special machinery. The company recently bought 10 special machines. The Ellis Motor Car Co., Newark, N. J., will require a few tools for a repair shop. The H. H. Franklin Mfg. Co., Syracuse, N. Y., has taken a long term lease on a building which it will convert for manufacturing purposes.

Possibly the largest inquiry to come out recently in the eastern crane market is that of the American Car & Foundry Co., calling for two 5-ton and three 10-ton overhead cranes, with spans of 50 and 90 feet respectively, for Chicago; and one 10-ton crane, with 100-foot span, and two 10-ton cranes, with 90-foot span, for Buffalo. It is understood this list absorbs the 10-ton crane with 90-foot span, recently inquired for. Another sizable list now pending in the East is that of the Kennedy-Van Saun Mfg. Co., 120 Broadway, New York, manufacturer of crushers. This list involves one 5-ton, one 10-ton, three 20-ton, and two 30-ton cranes. The spans involved are 24 and 60 feet.

Although no award has been announced, it is reported that bids on a 10-ton overhead crane, with 75-foot span, for the Stanley Works, New Britain, Conn., have been closed. The Harley Co., Springfield, Mass., has bought two Shepard and two Curtis cranes. The cranes were of two tons capacity, with spans of 24 feet. The Leffel Mfg. Co. is reported to have placed one each, 5, 10 and 20-ton overhead cranes for its plant at Springfield, O., with the Case Crane Co. An unconfirmed report of interest to the trade is to the effect that the Midvale Steel & Ordnance Co. has placed four 10-ton overhead cranes for its plant at Johnstown, Pa., with the Alliance Machine Works, Alliance, O. The Midvale company also has been inquiring for a 75-ton ladle crane, with 47-foot span, and two heavy ladle trolleys.

The American Tube & Stamping Co., Bridgeport, Conn., continues in the market for a 5-ton traveling crane with 25-foot span. A. Bentley & Son, Toledo, O., contractors, are inquiring for a gantry crane.

Labor Troubles Make Buyers Withhold Orders

ACTIVITY in machinery and tools in the Pittsburgh district continues more prospective than actual. With a strike of the coal miners coming on just as the steel strike was considered to be practically broken, hopes do not run particularly strong that much of the prospective business will materialize in the immediate future. Numerous inquiries for cranes are out, but few if any of them are being closed because of the labor situation. Dealers in tools report a fair amount of sales from the floors, but no new inquiries of any account. The Pennsylvania railroad, lines west, is putting out tool inquiries almost daily, but is closing on few if any of them. It is said that the Stark, O., car shops of this railroad is practically completed and ready for the installation of equipment but that most of it still is to be ordered.

Prospects for Winter Trade Good

BUYING of machine tools in the Chicago market continues excellent with prospects for winter trade being heavy. As has been the case for some time, most buying is of single tools or a small number but in addition to this several large consumers are covering their requirements by a series of orders. The Nash Motors Co. is preparing its first installment of requirements for the new plant being built at Milwaukee, and figures will be considered shortly. This is not expected to cover more than a small part of its eventual purchase. The Samsom Tractor Co., of the General Motors Corp., at Janesville, Wis., continues to spread its business, which has run into a large sum. The Santa Fe railroad recently placed an order for two shapers, one of the few recent purchases by railroads.

A fabricating concern recently placed an order for a heavy punch which represented an outlay of about $12,000. Another sale recently made was of a 60-inch planer with reverse motor, which also involved a large expenditure. Much demand is being made for heavy sheet metal-working machinery so much so that punch presses are almost unobtainable. Demand for soft drinks has stimulated activities of soda fountain supply manufacturers and the Liquid Carbonic Co. recently bought a large quantity of equipment for making holders for gas and charged water. This represented lathes, drills and other machinery for working copper, brass and steel. The Stromberg Motor Devices Co., Chicago, recently closed for considerable equipment.

Machine Tool Sellers Active in Cleveland

TRADING among Cleveland machine tool sellers at present consists mainly of small equipment and lighter tool sales. Despite great activity the aggregate value of orders placed seemingly is not commensurate with the energy expended. Much business, however, is prospective. Inquiries are numerous, so much so for one dealer that notwithstanding the combined effort of his clerical force, some of Friday and Saturday's voluminous mail had to be held over until Monday of this week. Action by purchasers on many of these inquiries will be delayed until the labor situation becomes definitely more settled. It is thought that if the impending coal strike becomes an actuality and is extended, its effect will be noted in decreased sales of equipment.

Larger inquiries come from the Detroit automotive field. About $100,000 worth of equipment is being inquired for and ordered by the Chevrolet Motor Co., Bay City, Mich. Dodge Bros., Detroit, has been a recent purchaser and an addition in course of erection will require more machinery. The Packard Motor Car Co., and the Paige-Detroit Motor Car Co., as well as the Ford Motor Co., and the Hudson Motor Car Co., Detroit, continue to figure among the larger purchasers of machine tools, etc. It is understood that the Ford tractor plant at Hamilton, O., now is ready for the installation of $1,500,000 worth of machinery. Much of this is on order but it is reported that a considerable amount still has to be specified. Machine shops for the Detroit Motor Car Co., Detroit, 275 x 528 feet; Escanaba Motor Car Co., Escanaba, Mich., 100 x 120 feet, and the Novo Engine Co., Lansing, Mich., 130 x 160 feet, all are about to issue lists of equipment requirements or have already done so. The National Spring & Wire Co., Grand Rapids, Mich., is installing machinery in its new plant. Presses, etc., will probably be required by the Jackson Stove & Stamping Co., Jackson, Mich., recently incorporated by Walter V. Sherwood and others at $200,000. The Gilmore Marine Motor Corp., 404 Twenty-fourth street, Detroit, is to increase its output of marine motors and this will necessitate the addition of considerable equipment. The Lemnar Mfg. Co., Saginaw, Mich., paper-baling machinery, is erecting an addition, quadrupling its capitalization to $200,000.

From outside of what is known as the Cleveland-Detroit territory, come a few inquiries which are of interest to dealers. Present equipment of S. P. Townsend & Co., Orange, N. J., manufacturer of lawn mowers, ball bearing mowers, etc., is to be doubled. A new building

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THE CONSULTATION

Between expert Engineer and Metallurgist is the real beginning of a Farrell-Cheek Steel Casting.

Here the tensile strength, thicknesses, pattern, etc—are discussed—and the alloys and ingredients determined.

From the time the blue prints and specifications leave their experienced hands until the casting is finished and examined for the last time—the same skilled care is given to each detail with the result of uniform smooth castings, specially suited to the particular needs.

Isn't *that* the casting you want?

Farrell-Cheek Steel Foundry Co.

Makers of Steel Castings that are a little better than the next best.

Sandusky, Ohio., U. S. A.

providing 70,000 additional square feet of floor space is being erected and a formal list of equipment requirements is expected soon. A fair sized list is issued by the Empire Axle Co., Dunkirk, N. Y., which is to double its present output of worm drive axles. Machinery, machine tools, electric cranes, power apparatus, etc., all will be purchased. Considerable equipment will be purchased by the American Motors Corp., 141 Broadway, New York City, which is building an addition to its plant in Plainfield, N. J., 60 x 280 feet. One forging furnace, one 13-inch lathe, one 16-inch shaper or crank planer, three or four presses, an automatic wire straightening and cutting machine, a welding machine, and a bench drill, motors, etc., will be purchased by the Kunehelm Mfg. Co., Gardner, Mass., manufacturer of children's vehicles.

Numerous smaller inquiries from the immediate vicinity of Cleveland are before sellers. The Post Tractor Co., Cleveland, is asking for a 2-spindle drilling and tapping machine among other tools. The Ohio Heating & Pipe Bending Co., 1063 West Eleventh street, Cleveland, is in the market for power apparatus, two lathes, etc., having increased its capital to $250,000 in order to erect a new plant. The Automatic Products Co., Cleveland, has been in the market for some equipment and has placed some orders, as has the National Screw Products Co., Detroit. The Wheeling Radiator & Mfg. Co., Cleveland, is understood to have filled its requirements of grinding machinery. The Lang Body Co., Cleveland, is making tentative inquiry for its equipment requirements for its enlarged plant. The Minerva Engine Co., Cleveland, is looking toward its new machine shop requirements. It is expected that some of the requirements of the Springfield Advance Machine Co., Springfield, O., incorporated by H. S. Bradley and others with $50,000, will be placed in Cleveland. When the F. R. Fortune Tool & Mfg. Co., Wooster, O., moves the business of the H. R. Lewis Tool Co., Detroit, which it has purchased, to the former town after the new plant is built, it will doubtless issue a list of machine tool needs.

Increased activity on the part of the railroads is noted. Inquiries are being received from the Pennsylvania lines west, as well as from the New York Central railroad, as referred to last week. Railroads consider that the outlook has improved for remedial legislation which will allow for a return of the railroads to private operation early next year. It is against that time that the railroad purchasing agents now are lining up shop requirements.

Further information about the proposed $50,000,000 steel car plant at Chillicothe, O., is unobtainable. Dealers and manufacturers representatives who went to Columbus, O., to see the engineer, W. H. Monahan Jr., reported to have charge of awarding 35 cranes, returned without being successful in communicating with the latter. Another effort is being made this week.

Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

BOSTON.—The Massachusetts Electric Dredge Co. has been incorporated with $50,000 capital by Charles E. Fay, Fred C. Fernald and Forrest H. Abbott, Quincy, Mass.

CHARLESTOWN, MASS.—The Crosby Steam Gauge & Valve Co., Boston, contemplates a foundry extension and office addition.

EAST CAMBRIDGE, MASS.—The H. B. Smith Co., Westfield, Mass., heating apparatus, is taking bids for a 1-story, 100 x 200-foot storehouse to cost $50,000.

EAST PROVIDENCE, R. I.—The Standard Oil Co. is having plans made for a 2-story and basement, 42 x 62-foot with a wing 32 x 30-foot laboratory and a 2-story and basement garage to include a 32 x 100-foot boiler room to cost $500,000.

MANSFIELD, MASS.—A large warehouse will be erected here by the Union Warehouse Corp.

MARLBORO, MASS.—The Koehler Mfg. Co. has let a contract for a 2-story, 50 x 250-foot plant.

SPRINGFIELD, MASS.—The Oliver Mfg. & Sales Co. has been incorporated to make a vehicle brake with $100,000 capital, by Oliver Patterson, Abraham Ratner and Max Rabinovitz.

SPRINGFIELD, MASS.—The Russell Electric Co. has been incorporated to make appliances with $10,000 capital, by Matthew Russell, Harold P. Litchfield, Newton, Mass., and Willmot Nash, Wollaston, Mass.

SPRINGFIELD, MASS.—The Eldridge Electric Mfg. Co. has been incorporated to make tools, appliances and hardware specialties, with $25,000 capital, by Arthur C. Wright, Norman B. Ellison, Holyoke, Mass., and R. A. Wright.

WATERTOWN, MASS.—C. M. Leach, Boston, has been awarded a contract to erect a 1-story, 67 x 75-foot building at the United States arsenal.

PAWTUCKET, R. I.—The Collyer Insulated Wire Co. will build a 60 x 110-foot plant addition at an estimated cost of $100,000.

PROVIDENCE, R. I.—The Crompton & Knowles Loom Works will build an addition to its foundry, 83 x 222 feet.

PROVIDENCE, R. I.—The Mueller Metal Co., 288 Dyer street, contemplates a plant, 2-stories, 50 x 100 feet, to cost $33,000.

BRIDGEPORT, CONN.—The Bridgeport Brass Co. has awarded a contract for an addition to its foundry, 120 x 220 feet, to cost $150,000.

BRIDGEPORT, CONN.—The Columbia Graphophone Co. will erect two 6-story and 4-story plants, which will be equipped with machinery for the manufacture of records.

BRIDGEPORT, CONN.—The O. K. Spring & Machine Co., Inc., has been incorporated with $5500 capital by A. F. Brown, Alex Langfelder and Ignatz Cneisler, both of New York.

BRIDGEPORT, CONN.—The Motive Products Corp. has been incorporated to make roller bearings, etc., with $300,000 capital, by Jonathan Grout, Fairfield, Conn., Louis C. Held and L. E. Disbrow.

CAMBRIDGE, MASS.—Bids closed Oct. 29 for a 4-story, 74 x 90-foot addition to the Cambridge Rubber Co.

EAST BERLIN, CONN.—The Connecticut Metal & Chemical Co. has started work on a plant addition, 1-story, 115 x 321 feet.

EAST HARTFORD, CONN.—Property has been purchased by the Atlantic Refining Co. for a new plant.

EAST NORWALK, CONN.—Plans are being drawn for a 5-story, 60 x 300-foot plant addition and a 2-story, 60 x 150-foot power house for the Crofut & Knapp Co.

HARTFORD, CONN.—The Hartford Rubber Works Co. contemplates spending several hundred thousand dollars on plant additions.

HARTFORD, CONN.—The Hartford Electric Welding Co. has been incorporated with $25,000 capital by George F. Smart, Harry A. Wilcox and S. W. Wilcox.

HARTFORD, CONN.—The Hanson-Whitney Mfg. Co. machine tools, has let the contract for a 4-story 60 x 120-foot plant, which with equipment will cost about $100,000.

HOLYOKE, MASS.—The Walsh's Holyoke Steam Boiler Works will build a 1-story erecting shop, at an estimated cost of $10,000.

MERIDEN, CONN.—The Charles Parker Co., maker of guns, screws and hardware, has let the contract for the erection of a 3-story, 50 x 200-foot plant addition.

MILFORD, CONN.—The Milford Machine & Tool Co. has been incorporated with $10,000 capital by

An Open Letter About Wood Block Floors

By P. C. REILLY

President Republic Creosoting Company, Manufacturers of Kreodone Wood Floor Blocks

EVERY man who is going to put a wood block floor in his factory should give most serious consideration to just what a wood block floor must be and what it must do for him.

If he orders "a wood block floor," without *knowing* the ins and outs and the whys and wherefores, he runs a pretty good chance of buying a costly disappointment.

The advantages and economy of wood block floors have been demonstrated and established beyond question, even before creosoted lumber was used.

The early decay and absorption of moisture by untreated blocks was overcome as soon as the antiseptic and sealing properties of creosote oil were established, and we developed the first creosoted wood block floor manufactured, using, then as now, a pure creosote oil as the preservative.

So it went on, step by step, until at last Kreodone Wood Floor Blocks were evolved. These perfect blocks are preserved with a creosote oil so pure and of such a high grade that we call it Kreodone Oil in order to avoid confusion with the general term of "creosote oil," which is indiscriminately applied to creosote oil of almost every grade.

Kreodone Oil is *not* an adulterated creosote oil; that is no tar or petroleum products are added to cheapen its cost and reduce its efficiency. Kreodone is a refined creosote oil; it is a creosote that has the volatile elements removed and only the constant, efficient elements of creosote left.

A wood block floor depends for its life and wear upon two things—the quality of the wood and the quality of the preservative oil used.

Kreodone Wood Floor Blocks are made of long-leaf yellow pine of the finest quality. This wood is given our own special treatment with our own Kreodone Oil. This antiseptic oil stays there permanently. It keeps out moisture; it prevents the action of decay. It increases the wearing resistance of the block.

You will know a Kreodone block by its *light brown* color. Split the block and you will see that this color characterizes the inside as well as the outside.

Now, when a poor grade of creosote oil is used, tar in some quantity is present. Such a block will be very dark, often black. After it is laid, the tar will exude, making the surface of the block sticky. That is annoying, but the real evil is that this poor oil is volatile. It *evaporates*. The tar coloring may remain, but the preservative is gone, and although the block may last for a few years—just as any wooden floor will—decay will eventually set in and the floor must be replaced.

These are important points for you to know. Installing a wood block floor is an investment of some consequence, not so much by reason of the money involved as because of the *service* you can and *should* receive from such a floor.

Our engineers will be glad to go into this matter fully with you. We can show you proof of the superior quality of Kreodone Blocks, and from a technical standpoint we can make it clear to the layman just why he should accept nothing less than Kreodone Wood Floor Blocks.

Write to us, telling us the space you have to cover and we will either send a representative to see you or write you exactly what in our judgment is the best way for you to get the full benefit of Kreodone Floor Blocks.

Kreodone EVERLASTING

WOOD BLOCK FLOORS

Republic Creosoting Company

INDIANAPOLIS, INDIANA

Plants:

Indianapolis Minneapolis Mobile
Seattle Norfolk

This picture shows part of finished floor at the plant of the NATIONAL ACME COMPANY, Cleveland, Ohio, before machinery was installed. This floor covers a space of 7 1-2 acres—300,000 square feet.

Geo. S. Rider Co. Archts.

W. A. Leonard, G. E. Closson, A. L. Montague and J. B. Dillon, Shelton, Conn.

NEW BRITAIN.—Work has been started by the Stanley Steel Works, on its new plant in this city. The main building will be 300 x 700 feet.

NEW BRITAIN, CONN.—The American Hardware Corp. has awarded a contract for a foundry addition, 2-stories, 62 x 264 feet, to cost $125,000.

NEW BRITAIN, CONN.—The Knebel Mfg. Co. has been incorporated to make steel, brass and other metals, with $50,000 capital by Richard Knebel, Herman G. Markle and William C. Betz.

NEW HAVEN, CONN.—The Wengraf Auto Hoist Co. has been incorporated with $10,000 capital by Jacob Sharpe, Frank Wengraf and S. C. Rosenberg.

NEW HAVEN, CONN.—The New England Iron Works has been incorporated with $250,000 capital by S. Z. Poli, Edward Poli, Abraham Natkin, James A. Natkin, Matthew A. Natkin, Benjamin A. Natkin, Harry L. Brooks and Walter M. Sheehan.

PLANTSVILLE, CONN.—A 50 x 240-foot forge shop will be erected by the Atwater Mfg. Co.

SOUTHINGTON, CONN.—Peck, Stow & Wilcox are progressing rapidly with a new plant addition, and equipment will be installed shortly.

TORRINGTON, CONN.—Plans are being drawn for a 3-story, 60 x 150-foot factory to cost $65,000 for the Torrington Mfg. Co., builder of machinery.

WATERBURY, CONN.—The Waterbury Farrel Foundry & Machine Co. has let a contract for a 72 x 102-foot machine shop and a 1-story hardening room. A foundry building will be erected later.

WORCESTER, MASS.—The Norton Co. has let the contract for a 1-story, 30 x 140-foot warehouse.

North Atlantic States

BROOKLYN, N. Y.—William E. Taylor & Co., Inc., contemplates making elaborate improvements to its plant.

BUFFALO.—The Contractors Ornamental Steel Co. recently was incorporated with $10,000 capital, by H. W. Meyer, J. H. Wilting and W. F. Schuets.

CORTLAND, N. Y.—The Cortland Sweeper Co., street sweepers, plows and harrows, has been incorporated with $25,000 capital, by F. L. Tichenor, G. F. Beaudry and E. W. Smith.

LONG ISLAND CITY, N. Y.—The Connelley Iron Sponge & Governor Co. has purchased a site on which it plans to erect a modern plant.

LONG ISLAND CITY, N. Y.—The Leeds Phonograph Record Co., Record and Review streets, contemplates a boiler house, 1-story, 28 x 49 feet, to cost $5000.

MINEOLA, N. Y.—The Allied Automotive Corp. has been incorporated with $250,000 capital, by J. F. Egan, W. E. Kisselburg and E. E. Gilman, 149 Broadway.

NEW YORK.—The Perth Amboy Dry Dock Co. is having plans drawn for a shipbuilding plant.

NEW YORK.—The Aeolian Co., 29 West Forty-second street, plans a warehouse and a boiler house.

NEW YORK.—The Liberty Auto Ignition Co. has been incorporated with $150,000 capital, by H. Eisenbach, L. Kretzer and L. Baskin, 1121 Tinton avenue.

NEW YORK.—The Geyser Electric Washing Machine Co. has been incorporated with $20,000 capital, by F. H. Butehorn, E. S. Hawley and R. S. Baker, 37 Wall street.

NEW YORK.—The Overland Caterpillar Chain Co. has been incorporated with $500,000 capital, by G. D. Proctor, J. J. Hegan and J. J. Krauss, 1213 Wheeler avenue.

NEW YORK.—Emilio Bracchi, machinery and metals, has been incorporated with $10,000 capital, by E. Bracchi, G. J. Giudici and N. Greenberg, 3 West 112th street.

NEW YORK.—The Vitreous Enameling & Stamping Co. has been incorporated with $300,000 capital, by H. Bruckner, W. J. Flynn and G. P. Morrell, 1632 University avenue.

NEW YORK.—The Utility Products Corp., electrical machinery and devices, has been incorporated with $100,000 capital, by G. Tiernan, 64 Wall street, G. H. Parcell and others.

NEW YORK.—The Gairas Mfg. Co. has been incorporated to make and repair machinery with $25,000 capital, by J. A. Poytras, G. F. Geissler, and J. A. Lyons, 319 East 159th street.

NEW YORK.—The Utility Products Corp., machinery and electrical supplies, has been incorporated with $100,000 capital, by F. H. Parcell, G. Tiernan and J. B. Parcell, 64 Wall street.

NIAGARA FALLS, N. Y.—The Republic Carbon Co. is taking bids for a large plant addition and a new office building, to cost $175,000.

NORTH TONAWANDA, N. Y.—The Horschell Spillman Co., 102 Sweeney street, has awarded a contract for a motor building addition, 64 x 114 feet.

ROCHESTER, N. Y.—The American Laundry Machinery Co. has had plans drawn for a machine shop addition.

SYRACUSE, N. Y.—The Vulcan Die Casting Corp. recently was incorporated with $150,000 capital, by C. M. Kessler, E. B. Frost and A. L. Wellhoefer.

SYRACUSE, N. Y.—The Whiting-Graser Co. has been incorporated to operate a machine shop with $25,000 capital, by J. T. Whiting, T. T. Graser and E. L. Wildman.

SYRACUSE, N. Y.—The C. W. Leed Mfg. Co. has been incorporated with $100,000 capital to manufacture hardware specialties in addition to a ball-bearing lubricating device.

ALLENTOWN, PA.—George H. Hardner has a permit to erect a machine shop, 75 x 85 feet, for James and Benjamin Eastwood.

CHAMBERSBURG, PA.—The Southwark Foundry & Machine Co., Philadelphia, has leased the plant of the Quincy Engine Co.

LANCASTER, PA.—The Lancaster Foundry Works has been incorporated with $150,000 capital, by Charles E. Long and others.

PHILADELPHIA.—The Pennsylvania Forge Co. has awarded a contract for a forge shop, 100 x 200 feet.

PHILADELPHIA.—Max Haupt has awarded a contract to the Standard Construction Co. for a forge shop addition.

PHILADELPHIA.—Plans are under way for a power house at the Frankford arsenal. The building will be 1-story, 135 x 139 feet.

PHILADELPHIA.—The Philadelphia Dyeing Machine Co. has awarded a contract for a plant, 1-story, 64 x 108 feet, to cost $22,000.

WASHINGTON, PA.—The Washington Molding Foundry & Machine Co. is reported planning a new foundry and cupola.

ELIZABETH, N. J.—The property of Runkel Bros., Inc., adjoining the plant of the Duesenberg Motors Corp., has been purchased by the Willys Corp.

JERSEY CITY, N. J.—The A. R. Burnette Corp. has been incorporated to manufacture tools, etc., by C. A. Cole, R. A. Van Vorhis and A. R. Oakley.

NEWARK, N. J.—A proposed plant costing $10,000 will be expended by the Ellis Motor Car Co. on a new garage 268 x 339 feet.

PATERSON, N. J.—The Paterson Vehicle Co. has had plans drawn for a body building, 1-story, 45 x 190 feet.

PATERSON, N. J.—The Citizens Iron & Metal Corp. recently was incorporated with $5000 capital, by Leo Rosenkopf, A. Glick and Morris Poritz.

TRENTON, N. J.—William B. and David Barber iron and steel jobbers, have purchased the plant of the New Jersey Wheel Co.

TRENTON, N. J.—The Safety Lock Co., 411 Broad street, recently was incorporated with $100,000 capital to manufacture locks, etc.

TRENTON, N. J.—The Ceramic Equipment Co. has been incorporated with $100,000 capital and is equipping a plant for the manufacture of dryer machinery. Harry D. Leavitt, Donald M. Miller and Joseph L. Buckley are the incorporators.

Central States Activity

ALGOMA, WIS.—The Algoma Panel & Veneer Co. will erect a 2-story plant addition, 56 x 224 feet.

BARABOO, WIS.—C. H. Crubb, manufacturer of steel barn equipment and farm specialties, will build a 3-story addition, 30 x 50 feet, at a cost of $15,000.

CHILI, WIS.—The Lynn-Chili Electric Co. has been organized by H. C. Portz, William Wagner, Oscar F. Franke and others, with $35,000 capital.

DE PERE, WIS.—Work has started by the Western Steel & Iron Co. on a 2-story shop addition, 34 x 163 feet, to cost $40,000.

EAU CLAIRE, WIS.—The Dependable Tractor & Truck Co., recently incorporated in Delaware with $750,000 capital, is establishing a plant here.

EDGERTON, WIS.—E. J. Rechord & Sons are having plans made for a 2-story garage and machine shop, 40 x 90 feet, to cost $20,000.

FT. ATKINSON, WIS.—The James Mfg. Co. has awarded contracts for a new foundry unit, 400 x 600 feet, to cost $250,000 with equipment.

KEWASKUM, WIS.—The Kewaskum Aluminum Co., a $150,000 corporation, contemplates erecting a plant, two stories, 60 x 200 feet.

KEWASKUM, WIS.—The Remmel Mfg. Co. has been organized with $50,000 capital to succeed the machine shop and foundry business of Nicholas Remmel. Additions to both foundry and machine shop are contemplated.

MADISON, WIS.—The Burgess Battery Co. has started work on a 1-story plant addition, 140 x 240 feet, to cost $200,000.

MANITOWOC, WIS.—The Frank Kerscher Co., sheet metal products, plans a 1-story warehouse addition, 60 x 120 feet.

MENOMONEE FALLS, WIS.—The Wisconsin Mfg. Co. has been founded to manufacture electrical accessories and supplies. Henry Storm is president and general manager. Additional machinery is reported being purchased.

MILWAUKEE.—The Milwaukee hospital is having plans prepared for a power plant and a boiler house addition to cost $25,000.

MILWAUKEE.—The Balance Valve Motor Co. has

been organized with $1,000,000 capital, by W. M. Baumbeckel, George Rusco and others.

MILWAUKEE.—The Metals Forms Corp., 1440 Booth street, will erect a 1-story plant addition, 41 x 64 feet, at an estimated cost of $20,000.

MILWAUKEE.—The Atlas Foundry Co., Thirty-eighth and Burnham streets, will erect a shop addition, 80 x 88 feet, to be used as a core room.

MILWAUKEE.—The Badger Screw Products Co. has been incorporated with $25,000 capital, by Harry H. Minnicar, J. Jaeckle and Walter A. John.

MILWAUKEE.—The Advance Boiler & Tank Co. recently was incorporated with $5000 capital, by William R. Andrae, C. A. Zacher and Emil J. Lepinsky.

MILWAUKEE.—Articles of incorporation have been filed by the Autolife Tire Chain Co. with $25,000 capital. Inrorporators are Fred A. Noya, Jacob Best and Henry J. Keller.

MILWAUKEE.—The Standard Light Fixture Co., organized with $25,000 capital, has leased a building at 448 East Water street, and is making alterations and installing machinery.

MILWAUKEE.—The Allis Mfg. Co. recently was incorporated to manufacture brass and bronze castings with $50,000 capital, by Paul M. Kuder, Otto J. Juttner and John Garvey.

MILWAUKEE.—The Milwaukee Engineering & Tool Co. has been organized by John B. Pimm, Arthur R. Podlasky and J. Jaeckle to manufacture and deal in machinery. The company is capitalized at $25,000.

MILWAUKEE.—The Superior Brass Foundry Co., a new $50,000 corporation organized by Philip Leeber, Frank Schedler and H. H. Wheeler, has taken over the shop building at 282 Lapham street, and is converting it into a brass and bronze casting shop.

OSHKOSH, WIS.—The Doman Mfg. Co., which has acquired the assets of the Oshkosh Washing Machine Co., will build a 1-story plant addition, 40 x 200 feet, and enlarge its power plant. H. C. Doman is general manager.

RACINE, WIS.—The Walker Mfg. Co. is erecting a gray iron foundry, 80 x 120 feet.

RACINE, WIS.—The Hamilton-Beach Mfg. Co. has started work on a new foundry building, 80 x 200 feet.

RACINE, WIS.—The J. I. Case Threshing Machine Co. has awarded contracts for a 1-story plant addition, 75 x 125 feet.

RACINE, WIS.—The Standard Foundry Co. has increased its capital from $50,000 to $100,000. The new issue of stock will be used for development of facilities.

RACINE, WIS.—The Ajax Auto Parts Co. has let the contract for a 1-story plant addition, 64 x 130 feet. Erection of another addition, 85 x 120 feet, is also contemplated.

STANLEY, WIS.—The Stanley Toy Works, organized with $85,000 capital, has awarded contracts for a plant, two stories, 75 x 180 feet, to cost $50,000.

TOMAHAWK, WIS.—Plans are being prepared for improvements to the municipal waterworks.

TWIN LAKE, WIS.—Charles Rademacher plans a public garage and machine shop, 65 x 155 feet, to cost $20,000.

TWO RIVERS, WIS.—Sam Schwartz & Son have broken ground for a smelting and refining plant, 60 x 150 feet. Machinery and equipment is being purchased.

WAUSAU, WIS.—Articles of incorporation have been filed by the Star Mfg. Co., which is capitalized at $1,000,000. The company will manufacture milking machines and automatic farm appliances. John L. Sell is secretary.

DETROIT.—The Gear Grinding Machine Co. has awarded a contract for a plant, 180 x 215 feet.

DETROIT.—The Detroit Motor Car Co., McKinstry street, is taking bids on a machine shop, 275 x 523 feet.

ESCANABA, MICH.—The Escanaba Motor Car Co. will build a service building including a machine shop, 100 x 120 feet, costing $45,000.

GRAND RAPIDS, MICH.—The Keeler Brass Works is building an addition, 75 x 100 feet, costing $25,000.

GRAND RAPIDS MICH.—The Kent Steel Co., fabricators and erectors, has purchased a site on which it plans a plant.

JACKSON, MICH.—The Jackson Steel Products Co. has awarded a contract for a plant addition, to cost $70,000.

LANSING, MICH.—The Novo Engine Co. will build a plant including a machine shop, one story, 130 x 160 feet.

CHICAGO.—The Hamler Boiler & Tank Co., 3906 South Halstead street, plans a power plant, 1-story.

CHICAGO.—The plant of the Wright Machine Works, 1150 South Washtenaw avenue, recently was damaged by fire.

CHICAGO.—Fred C. Dickow, 1857 West Lake street, will build a machine shop, 77 x 100 feet, costing $20,000.

CHICAGO.—The William R. Johnston Mfg. Co., 359 East Ohio street, will build a 1-story plant, 120 x 450 feet.

CHICAGO.—The Walker Vehicle Co., Thirty-ninth and Wallace streets, is taking bids for a plant, 202 x 528 feet.

CHICAGO.—The Powell Steel Kitchen Co., 219 Loomis street, plans a plant, 1-story, 96 x 144 feet, to cost $25,000.

CHICAGO.—The Chicago Insulated Wire & Cable Co. is taking bids on an addition, 100 x 100 feet, to cost $22,000.

CHICAGO.—The National Machine Works, 936 Weed street, plans a machine shop, 2-stories, 39 x 108 feet, to cost $10,000.

CHICAGO.—The International Lubricants Co., 325 North Clark street, contemplates a 2-story plant, 40 x 104 feet, to cost $25,000.

CHICAGO.—The Fitzsimons Steel & Iron Co., manufacturers of cold-darwn steel, has bought a site on which it plans to build a plant.

CHICAGO.—The Ursus Motor Co., manufacturer of automobiles, 6601 Grand avenue, will build a one and 2-story plant, 120 x 150 feet, costing $50,000.

CHICAGO.—The Arthur Jones Electrical Co., Arthur Jones president, 2837 South State street, is preparing to build a 2-story plant, 125 x 135 feet, costing $60,000.

CHICAGO.—The Chicago Shoe Machine Co., 12 North Desplaines street, capitalized at $50,000, has been chartered by A. H. Lyckenback, R. H. Rudolph and Charles Friedman.

CHICAGO.—The Chicago & Alton railroad, Henry T. Douglas chief engineer, has started work on the first of two freight house units in Chicago, 155 x 460 feet. The two units will cost approximately $1,000,000.

CICERO, ILL.—The Bodine Electric Co. is taking bids for a plant addition, 95 x 129 feet, to cost $45,000.

GALESBURG, ILL.—The Lowe Mfg. Co. has awarded a contract for a plant, 1-story, 140 x 150 feet, to cost $125,000.

ANDERSON, IND.—The Anderson Foundry & Machine Works, W. N. Durkin president, is planning a 2-story plant, 80 x 200 feet, to cost $75,000.

INDIANAPOLIS.—The National Metal Products Co. recently was organized with $100,000 capital. E. E. Gates is president of the company.

CINCINNATI.—The Pfan Mfg. Co. plans a foundry, 60 x 225 feet, to cost $45,000.

CLEVELAND.—The Grant Lees Gear Co. has awarded a contract for a plant, 3-stories, 68 x 120 feet, to cost $200,000.

CLEVELAND.—The Auto Screw Products Co. has awarded a contract for a plant, 1-story, 80 x 149 feet, to cost $50,000.

COLUMBUS, O.—The American Zinc, Lead & Smelting Co. is reported contemplating new buildings here.

COLUMBUS, O.—The Columbus Wire Fence Co. has been incorporated with $50,000 by G. W. Moore, L. F. Stricklin, Charles H. Wilkins, Ellis R. Hays and Henry I. Donnelly.

ELYRIA, O.—The Elyria Iron & Steel Co. has awarded a contract for an addition, 2-stories, 80 x 160 feet, to cost $60,000.

Business in Canada

ST. BONIFACE, MAN.—The Western Steel & Foundries Co., a subsidiary of the Dominion Wheel & Foundries, Ltd., will establish a manufacturing plant here for the manufacture of car wheels, etc.

WINNIPEG, MAN.—The power commission will extend its power plant at Minnedosa, Man.

MONTREAL, QUE.—The National Iron & Steel, Ltd., has been incorporated to manufacture iron, etc., with $100,000 capital by William L. Scott, George D. Kelley, Allan J. Fraser and others.

MONTREAL, QUE.—The Thermos Heating Systems, Ltd., has been incorporated by Frank B. Common, Francis G. Bush, Herbert W. Jackson and others, with $600,000 capital to manufacture stoves, heaters, machinery, heating and insulating apparatus, etc.

MONTREAL, QUE.—The Economical Refrigerator Mfg. Co., Ltd., has been incorporated to manufacture refrigerators, etc., with $100,000 capital by Onesime Readman and Louis A. Octeau both of Montreal; Joseph Caseau and Francois A. Readman both of Grand Mere, Que.

WATERLOO, QUE.—The Roxton Mill & Chair Mfg. Co. will build an addition to cost $10,000.

NIAGARA FALLS, ONT.—The Carbon Alloy Co. has let the general contract for a plant here to cost $80,000.

TORONTO, ONT.—The Bishop-Barker Co., Ltd., has been incorporated with $40,000 capital to manufacture aeroplanes, motors, engines, etc., by William J. Beattie, 44 King street west, Howard A. Harrison and others.

TORONTO, ONT.—M. A. Cumming & Co., Ltd., has been incorporated to make machinery, hatters' tools, etc., with $40,000 capital, by Wilfred Field, 157 Bay street, George M. Orr, 1253 King street west, and others.

TORONTO, ONT.—The Chase Tractor Corp., Ltd., care of architect A. H. Harkness, Confederation Life building, has awarded the general contract for alterations and the erection of an addition to its plant here to cost $40,000.

TORONTO, ONT.—The Dolomite Products Co., Ltd., has been incorporated to manufacture and refine metals, etc., with $100,000 capital, by John A. W. Archer, 35 Melbourne avenue, Melville B. R. Gordon, Arthur R. Nesbitt and others.

TORONTO, ONT.—The Canadian John Wood Mfg. Co., Ltd., has been incorporated to manufacture tanks, etc., with $300,000 capital, by Thomas Phelan, 550 Kingston road, John M. Godfrey, room 235, 76 Adelaide street west, and others.

TORONTO, ONT.—The Steel Burial Vaults, Ltd., has been incorporated with $100,000 capital to manufacture steel burial vaults, etc., by George H. Sedgewick, room 1007, 36 Toronto street, John W. Pickup, 255 Glenlake avenue and others.

Iron and Steel Prices

Corrected to Tuesday Noon

Iron Ores

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 iron	$6.45
Mesabi Bessemer, 55 iron	6.20
Old range non-Bess., 51½ iron	5.70
Mesabi non-Bess., 51½ iron	5.55

Manganese Ore

Brazilian, 45 to 50 per cent, c.i.f. Atlantic ports, 55c per unit, nominal.

Indian, 45 to 50 per cent, c.i.f. Atlantic ports, 55c per unit, nominal.

Warehouse Prices

Steel bars, Boston	3.40c
Steel bars, Chicago	3.37c
Steel bars, Cleveland	3.27c
Steel bars, Detroit	3.38c
Steel bars, Philadelphia	3.60c
Steel bars, New York	3.37c
Steel bars, St. Louis	3.44c
Steel bars, Cincinnati	3.38c
Steel bars, St. Paul	3.595c
Steel bars, Buffalo	3.45c
Iron bars, Boston	3.40c
Iron bars, Buffalo	4.15c
Iron bars, Chicago	3.37c
Iron bars, Detroit	3.33c
Iron bars, St. Louis	3.44c
Iron bars, Cincinnati	3.33c
Iron bars, Philadelphia	3.60c
Iron bars, New York	3.37c
Shapes, Chicago	3.47c
Shapes, Detroit	3.43c
Shapes, Boston	3.50c
Shapes, St. Louis	3.54c
Shapes, St. Paul	3.695c
Shapes, New York	3.47c
Shapes, Cleveland	3.37c
Shapes, Philadelphia	3.70c
Shapes, Buffalo	3.55c
Shapes, Cincinnati	3.43c
Plates, Buffalo	3.75c
Plates, Chicago	3.67c
Plates, Detroit	3.63c
Plates, Boston	3.70c
Plates, St. Louis	3.74c
Plates, St. Paul	3.895c
Plates, New York	3.67c
Plates, Cleveland	3.57c
Plates, Philadelphia	3.90c
Plates, Cincinnati	3.63c
No. 10 blue anl. sheets, N. Y.	4.82c
No. 10 blue anl. sheets, Chicago	4.57c
No. 10 blue anl. sheets, Cleveland	3.80c
No. 10 blue anl. sheets, Boston	4.85c
No. 10 blue anl., Buffalo	4.65c
No. 10 blue anl. sheets, St. L.	4.64c
No. 10 blue anl. sheets, Cincinnati	4.53c
No. 10 blue anl. sheets, St. Paul	4.795c
No. 10 blue anl. sheets, Detroit	4.53c
No. 28 black sheets, Chicago	5.62c
No. 28 black sheets, New York	5.75c
No. 28 black sheets, Cleveland	4.60c
No. 28 black sheets, Boston	6.15c
No. 28 black sheets, Cincinnati	4.93c
No. 28 black sheets, Detroit	5.58c
No. 28 black sheets, St. Louis	5.695c
No. 28 black sheets, St. Paul	5.845c
No. 28 black sheets, Buffalo	5.70c
No. 28 galv. sheets, Chicago	6.97c
No. 28 galv. sheets, New York	7.00c
No. 28 galv. sheets, Boston	7.50c
No. 28 galv. sheets, Cleveland	5.95c
No. 28 galv. sheets, Cincinnati	6.28c
No. 28 galv. sheets, Detroit	6.93c
No. 28 galv. sheets, Buffalo	7.05c
No. 28 galv. sheets, St. Louis	7.045c
Bands, Boston	4.60c
Bands, Detroit	4.03c
Hoops, Boston	4.70c
Hoops, Detroit	4.03c
Cold rolled shafting and screw stock, New York	5.00c
Cold rolled flats, squares and hexagons, New York	5.50c

Sheet Schedule—(Black)

Differentials for gage, per 100 pounds.

No. 30	+20c
No. 29	+10c
No. 28 (carloads)	Base
No. 27	—05c
Nos. 25-26	—10c
Nos. 22-24	—15c
Nos. 17-21	—20c
Nos. 15-16	—25c
Nos. 13-14	—30c
Nos. 10-12	—35c

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28 and 30 inches ide by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28 in addition to the foregoing, 36 wide by 96 inches and 120 inches long.

Extras for width and length to be added.

Galvanized and Long Terne

Differentials for gage, per 100 pounds.

No. 30	+5c
No. 29	+25c
No. 28 (carloads)	Base
No. 27	—15c
Nos. 25-26	—30c
Nos. 22-24	—45c
Nos. 17-21	—60c
Nos. 15-16	—75c
Nos. 12-14	—90c
Nos. 10-11	—1.00

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28, 30 and 36 inches wide by 72, 84, 96 and 120 inches long.

Extras for width and length to be added.

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:

Cleveland	$1.40
Newark, N. J.	4.80
Boston	5.20
Philadelphia	4.40
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70

Buffalo to:

Albany, N Y.	$1.80
New England (rail)	3.90
New York and Brooklyn (rail)	3.90

Virginia furnaces to:

Philadelphia	$4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40

Birmingham, Ala., to:

Boston	$8.00
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York	7.70
Philadelphia	6.50
Pittsburgh	5.70
Savannah, Ga.	3.40
St. Louis	4.25

Chicago to:

Des Moines	$3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90

Ironton and Jackson, O., to:

Chicago	$3.80
Cincinnati	1.80
Cleveland	2.40
Detroit	2.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:

New York	27.0 cents
Philadelphia	24.5 cents
Boston	30.0 cents
Buffalo	21.5 cents
Baltimore	23.0 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

Blue Annealed

Differential for gage per 100 pounds

Nos. 8 and heavier	— 5c
Nos. 9 and 10 (carloads)	Base
Nos. 11 and 12	+ 5c
Nos. 13 and 14	+10c
Nos. 15 and 16	+20c

Standard Sizes

Widths—24-26-28-30-36 and 48 inches.

Lengths—72-84-96-120 and 144 inches.

Extras for width and length to be added.

Tubular Goods

Steel Pipe

Pittsburgh basing discounts to jobbers in carloads

STANDARD WEIGHT

Butt Weld

	Black	Galv.
⅛, ¼ and ⅜-inch	50½	24
½-inch	54½	40
¾ to 3-inch	57½	44

Lap Weld

2-inch	50½	38
2½ to 6-inch	53½	41
7 to 12-inch	50½	37
13 to 14-inch	41	..
15-inch	38½	..

PLUGGED AND REAMED

Butt Weld

1 to 3-inch	55½	42
2-inch	48½	36

Lap Weld

2½ to 6-inch	51½	39

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼ and ⅜-inch	46½	29
½-inch	51½	39
¾ to 1½-inch	55½	43
2 to 3-inch	56½	44

Lap Weld

2-inch	48½	37
2½ to 4-inch	51½	40
4½ to 6-inch	50½	39
7 to 8-inch	46½	33
9 to 12-inch	41½	28

DOUBLE EXTRA STRONG PLAIN

Butt Weld

½-inch	42½	32
¾ to 1½-inch	45½	35
2 to 2½-inch	47½	37

Lap Weld

2-inch	40½	31
2½ to 4-inch	42½	33
4½ to 6-inch	41½	32
7 to 8-inch	36½	23

Wrought Iron Pipe

Pittsburgh basing discounts to jobbers in carloads

THREADS AND COUPLINGS

Butt Weld

	Black.	Galv.
⅛ and ¼-inch	29½	2½
⅜-inch	30½	3½
½-inch	34½	16½
¾ to 1½-inch	39½	23½

Lap Weld

2-inch	32½	18½
2½ to 6-inch	34½	21½
7 to 12-inch	31½	18½

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼, ⅜-inch	28½	11½
½-inch	33½	20½
¾ to 1½-inch	39½	24½

Lap Weld

2-inch	33½	20½
2½ to 4-inch	35½	23½
4½ to 6-inch	34½	22½
7 and 8-inch	26½	14½
9 and 12-inch	21½	9½

DOUBLE EXTRA STRONG PLAIN ENDS

Butt Weld

	Black	Galv.
½-inch	20½	8½
¾ to 1½-inch	25½	13½

Lap Weld

2-inch	20½	8½
2½ to 4-inch	22½	13½
4½ to 6-inch	21½	12½

Lapweld Boiler Tubes

Discounts off manufacturers' standard list, in carloads; less carloads, 4 points less.

Steel

1¾ and 2-inch	19
2¼-inch	24
2½ to 3¼-inch	30½
3½ to 4½-inch	40½

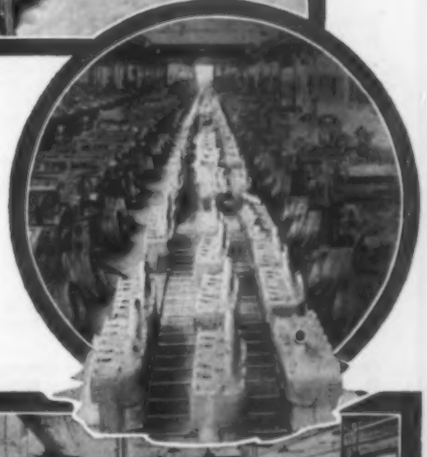
Iron

1¾-inch	+20
2 and 2¼-inch	+10
2½ and 2¾-inch	+ 1
3 and 3¼-inch	— 1½
3½ to 4½-inch	—16

LINK-BELT
LABOR-SAVING CONVEYORS

THESE illustrations show some of the Link-Belt Assembling Conveyors designed and built by us for the Willys-Overland Company, Toledo, Ohio.

The high increase in production of automobiles by the several prominent American Manufacturers was made possible only by the use of such time-and-labor-saving equipment and today these concerns are practically dependent upon modern and efficient labor-saving conveyors.



Let our experienced engineers look over your methods of production, and find out if there is a better way to handle your products. The present-day scarcity of labor makes it necessary for the progressive manager to select the simplest methods of production. Link-Belt Conveyors can be found today in some of the smallest as well as the very largest plants in the country. Write today.

LINK-BELT COMPANY 374

PHILADELPHIA		CHICAGO		INDIANAPOLIS	
New York	299 Broadway	Seattle	576 First Ave. S.		
Boston	49 Federal St.	Portland, Ore.	First and Stark Sts.		
Pittsburgh	1861 Park Bldg.	San Francisco	582 Market St.		
St. Louis	Central Nat'l Bank Bldg.	Los Angeles	163 N. Los Angeles St.		
Buffalo	547 Ellicott Square	Toronto, Can.	Canadian Link-Belt Company, Ltd.		
Wilkes-Barre	2d Nat. Bank Bldg.	Denver	Lindrooth, Shubart & Co., Boston Bldg.		
Huntington, W. Va.	Robson Prichard Bldg.	Louisville, Ky.	Frederick Wehle, Starks Bldg.		
Cleveland	420 Rockefeller Bldg.	New Orleans	C. O. Hine, Hibernia Bank Bldg.		
Detroit	903 Dime Bank Bldg.	Birmingham, Ala.	S. L. Herron, 720 Brown-Marx Bldg.		
Minneapolis	418 S. Third St.				
Kansas City, Mo.	306 Elmhurst Bldg.				

Iron and Steel Scrap Prices

Corrected to Tuesday Noon

Steel Works Scrap

Gross Tons Delivered to Consumer

HEAVY MELTING STEEL

Pittsburgh	$20.00 to 21.00
Chicago	19.50 to 20.00
Eastern Pennsylvania	20.00 to 22.50
Cleveland	19.50 to 20.00
St. Louis	18.50 to 19.00
Buffalo	19.00 to 20.00
New York (dealers)	15.50 to 16.00
Cincinnati	16.50 to 17.00
Birmingham	20.00 to 21.00
Valleys	19.50 to 20.00
Boston (dealers)	15.50 to 16.50

BUNDLED SHEETS

Pittsburgh	15.00 to 15.50
Eastern Pennsylvania	16.00 to 17.00
Cleveland	13.00 to 13.50
Buffalo	14.50 to 15.00
Cincinnati	12.50 to 13.00
St. Louis	11.00 to 12.50

STEEL RAILS, SHORT

Chicago	$22.00 to 22.50
Boston (dealers)	15.50 to 16.00
Cleveland	17.00 to 17.50
St. Louis	22.50 to 23.00
Birmingham	19.00 to 21.00
Cincinnati	20.50 to 21.00

STOVE PLATE

Pittsburgh	$19.00 to 20.00
Chicago	25.25 to 25.75
Eastern Pennsylvania	21.00 to 22.00
Cleveland	19.25 to 20.25
St. Louis	22.00 to 22.50
Buffalo	22.00 to 22.50
New York	17.50 to 18.00
Cincinnati	16.50 to 17.00
Birmingham	21.00 to 22.00
Boston	19.00 to 20.00

LOW PHOSPHORUS

Pittsburgh, billet and bloom crops	$24.00 to 25.00
Chicago, billet and bloom crops	24.00 to 25.00
Eastern Penn. (guaranteed)	25.75 to 26.25
Buffalo	23.50 to 24.00

SHOVELING STEEL

Chicago	$18.50 to 19.00
St. Louis	17.50 to 18.00

KNUCKLES, COUPLERS AND SPRINGS

Pittsburgh	$21.00 to 21.50
Chicago	22.00 to 22.50
St. Louis	20.50 to 21.00

BALED SHEETS

Pittsburgh	17.00 to 17.50
Chicago	15.50 to 16.00

FROGS, SWITCHES, GUARDS

Chicago	19.50 to 20.00
St. Louis	19.00 to 19.50
Eastern Pennsylvania	20.00 to 22.50

BOILER PLATE, CUT

Chicago, No. 1	$15.50 to 16.00
St. Louis	14.50 to 15.00

ANGLE BARS—STEEL

Chicago	$21.50 to 22.50
St. Louis	19.00 to 19.50

Iron Mill Scrap

Gross Tons Delivered to Consumer

RAILROAD WROUGHT

Pittsburgh, No. 1	$23.00 to 24.00
Pittsburgh, No. 2	21.00 to 21.50
Chicago, No. 1	22.50 to 23.00
Chicago, No. 2	21.25 to 21.50
Eastern Pennsylvania, No. 1	27.00 to 28.00
Cleveland, No. 1	23.25 to 23.75
St. Louis, No. 1	20.50 to 21.00
St. Louis, No. 2	19.50 to 20.00
Buffalo	23.00 to 23.50
Cincinnati, No. 1	19.50 to 20.00
Birmingham, No. 1	17.00 to 18.00
New York, No. 1 (dealers)	24.00
Boston (dealers)	18.50 to 19.00

WROUGHT PIPE

Eastern Pennsylvania	$18.00 to 19.00
Eastern Pennsylvania, ungraded	13.00 to 14.00
Buffalo	17.50 to 18.00
New York (dealers)	15.00 to 15.50
Boston (dealers)	14.00 to 14.50

YARD WROUGHT

Eastern Pennsylvania, No. 1	$22.00 to 23.00

CITY WROUGHT

New York, long (dealers)	19.00 to 19.50

BUSHELING

Chicago, No. 1	$19.50 to 20.00
Chicago, No. 2	13.00 to 14.00
Cleveland, No. 1	17.00 to 17.50
Cleveland, No. 2	14.50 to 15.00
St. Louis, No. 1	18.50 to 19.00
Buffalo, No. 1	16.50 to 17.50
Cincinnati, No. 1	14.50 to 15.00
Eastern Pennsylvania, No. 1	15.00 to 16.00

MACHINE SHOP TURNINGS

Pittsburgh	$12.50 to 13.00
Chicago	9.50 to 10.00
Eastern Pennsylvania	15.50 to 16.50
Eastern Pennsylvania (blast furn.)	14.00 to 15.00
Eastern Pennsylvania (chemical)	18.50 to 19.50
Cleveland	9.00 to 9.50
Buffalo	12.00 to 12.50
New York (dealers)	11.50 to 12.00
St. Louis	12.00 to 12.50
Cincinnati	7.50 to 8.00
Birmingham	11.00 to 13.00
Valleys	11.00 to 11.50
Boston (dealers)	10.50 to 11.00
Boston (blast furnace) (dealers)	10.50 to 11.00

CAST IRON BORINGS

Pittsburgh	$15.50 to 16.00
Chicago	11.50 to 12.00
Eastern Pennsylvania	16.00 to 17.00
Eastern Pennsylvania (chemical)	19.00 to 20.00
Cleveland	13.00 to 13.50
St. Louis	12.00 to 12.50
Buffalo	13.50 to 14.00
New York (dealers' price)	14.00 to 14.50
Cincinnati	8.00 to 8.50
Birmingham	11.00 to 13.00
Valleys	14.25 to 14.75
Boston (dealers)	14.00 to 14.50
Boston (blast furnace) (dealers)	12.00 to 12.50

IRON AXLES

Pittsburgh	$34.00 to 35.00
Chicago	33.00 to 34.00
Eastern Pennsylvania	35.00
Cleveland	35.00 to 36.00
St. Louis	33.00 to 33.50
Buffalo	28.00 to 29.00
Cincinnati	23.00 to 23.50

IRON RAILS

Chicago	25.00 to 25.50
Cleveland	27.00 to 28.00
St. Louis	23.50 to 24.00
Buffalo	24.00 to 25.00
Cincinnati	23.00 to 23.50

PIPES AND FLUES

Chicago	17.50 to 18.00
Cleveland	16.25 to 16.75
St. Louis	17.00 to 17.50
Cincinnati	15.00 to 15.50

GRATE BARS

Chicago	$22.50 to 23.00
Cleveland	21.00 to 21.50
Buffalo	20.00 to 20.50
New York	16.50 to 17.00
Eastern Pennsylvania	20.00 to 21.00

FORGE FLASHINGS

Cleveland, large	$13.00 to 13.50
Cleveland, small	16.25 to 16.25
Chicago, small	13.00 to 13.50
Boston (dealers)	12.00 to 12.50

ORGE SCRAP

Chicago	$21.00 to 21.50
Eastern Pennsylvania, No. 1	16.00 to 17.00
Boston	10.50 to 11.00

ARCH BARS AND TRANSOMS

Chicago	23.00 to 23.50
St. Louis	24.00 to 24.50

ANGLE BARS—IRON

Chicago	$26.50 to 27.00
St. Louis	21.00 to 21.50

Iron and Steel Works Scrap

Gross Tons Delivered to Consumer

AXLE TURNINGS

Pittsburgh	$16.00 to 17.00
Eastern Pennsylvania	16.00 to 17.00
Boston (dealers)	11.50 to 12.00
St. Louis	13.00 to 13.50
Cleveland	17.00 to 17.50
Buffalo	16.00 to 17.00
Chicago	14.50 to 15.00

STEEL CAR AXLES

Pittsburgh	$27.00 to 28.00
Eastern Pennsylvania	32.00
Cleveland	34.00 to 35.00
St. Louis	29.00 to 29.50
Buffalo	28.00 to 29.00
Chicago	27.50 to 28.00
New York (dealers)	24.00 to 25.00
Birmingham	21.00 to 22.00
Boston (dealers)	24.50 to 25.00

SHAFTING

Eastern Pennsylvania	$26.00 to 28.00
St. Louis	28.00 to 28.50
New York (dealers)	24.00
Chicago	28.50 to 29.00

Iron Foundry Scrap

Gross Tons Delivered to Consumer

CAR WHEELS

Pittsburgh, iron	$24.00 to 24.50
Pittsburgh, steel	21.50 to 22.00
Chicago, iron	26.00 to 26.50
Eastern Pennsylvania, iron	24.50 to 25.00
Cleveland, iron	23.00 to 24.00
St. Louis, iron	23.50 to 24.00
Buffalo, iron	22.50 to 23.50
Birmingham, iron	20.00 to 21.00
Birmingham, tram car	19.00 to 20.00
Boston	23.00 to 24.00
Cincinnati	21.00 to 21.50

NO. 1 CAST SCRAP

Pittsburgh, cupola	$25.00 to 26.00
Chicago, cupola	29.50 to 30.00
Eastern Pennsylvania, cupola	25.00 to 26.00
Cleveland, cupola	25.50 to 26.00
New York, cupola (dealers)	22.50 to 23.00
Cincinnati No. 1 cupola	21.50 to 22.00
Birmingham, cupola	23.00 to 24.00
St. Louis, railroad	27.50 to 28.00
St. Louis, agricultural	26.50 to 27.00
Buffalo	24.50 to 25.00
Boston	28.00 to 28.50
Valleys	25.00 to 25.50

HEAVY CAST

New York (dealers)	22.00 to 22.50
Buffalo	21.00 to 22.00
Pittsburgh	22.00 to 23.00
Cleveland	18.50 to 19.00
Boston	19.00 to 19.50

MALLEABLE

Pittsburgh, railroad	$24.00 to 25.00
Pittsburgh, agricultural	20.00 to 21.00
Chicago, railroad	22.50 to 23.00
Chicago, agricultural	22.50 to 23.00
Eastern Pennsylvania, railroad	20.00 to 21.00
Cleveland, railroad	20.50 to 21.00
Cleveland, agricultural	17.75 to 18.50
St. Louis, railroad	18.50 to 19.00
St. Louis, agricultural	16.50 to 17.00
Cincinnati, railroad	18.00 to 18.50
Cincinnati, agricultural	14.50 to 15.00
Boston	19.50 to 20.50
Buffalo	19.00 to 20.00

Miscellaneous Scrap

Gross Tons Delivered to Consumer

RE-ROLLING RAILS

3 feet and over

Pittsburgh	$25.00 to 26.00
Chicago	29.50 to 30.00
Eastern Pennsylvania	Nominal
Cleveland	26.00 to 27.00
St. Louis	26.50 to 28.00
Birmingham	23.00 to 24.00
Boston (dealers)	20.00 to 20.50

LOCOMOTIVE TIRES

Chicago	21.00 to 21.50
St. Louis	19.00 to 19.50

BOILER PUNCHINGS

Chicago	$24.00 to 25.00
Eastern Pennsylvania	23.00 to 24.00

Shipments from Stock ——

Government material at

prices ~~lower~~ under present card quotations.

1500 tons Billets $7\frac{29}{32}$

2000 " Shell 3" - $4\frac{1}{2}$" - 6" - 9"

1000 " Tie Bars $\frac{5}{8} \times 3$"

800 " Ingots for $9\frac{2}{2}$" Shell

100 " C.R. Bessemer Rounds $1\frac{9}{32}$

Ask for prices on these, also let us know what other grades you need, or have for sale.

The James D. Miller Co.

McCormick Bldg

Chicago.

New Trade Publications

AIR HOISTS.—The Northern Engineering Works, Detroit, has published catalog No. 35, in which it describes and illustrates several types of vertical and horizontal air hoists. One type is equipped with a double beam socket bearing trolley, for use on cranes where head room is limited. Air jacks and air operated elevators are also described and illustrated in the booklet.

STRUCTURAL STEEL.—A 24-page illustrated booklet has been issued by the Truscon Steel Co., Youngstown, O., in which the use of structural pressed steel for floors, roofs, walls, partitions, etc., is described and illustrated. A number of the illustrations are of buildings in the process of construction, showing how pressed steel beams and reinforced concrete beams are used.

TURBINE BLADING.—A thorough description, accompanied by numerous illustrations, of steam turbine blading, is given in a 26-page booklet recently published by the Allis-Chalmers Mfg. Co., Milwaukee. The various methods of manufacture are described at length. The booklet contains a description of the manner in which the modern steam turbine attained its present status in industry. The booklet is interesting and contains much valuable information.

FORGINGS.—An 18-page booklet is being circulated by the Allis-Chalmers Mfg. Co., Milwaukee, which contains a number of illustrations showing the various equipment in the forging department of that company. The heating an annealing equipment is oil fired and equipped, and the plant is modernly equipped with chemical and physical laboratories. The illustrations indicate the wide range of work done in the plant.

ELECTRIC HOISTS.—The Northern Engineering Works, Detroit, has published a 16-page booklet in which electric hoists are described and illustrated. In these hoists, the gearing is of forged steel, annealed. Gears are enclosed. All hoists are equipped with two brakes and a limit stop automatically stops the hook at the top of the lift. The bearings are of phosphor bronze and are automatically lubricated. Other data and numerous illustrations are given.

OIL-BURNING EQUIPMENT.—The General Combustion Co., Chicago, has issued three bulletins, Nos. 52, 53 and 54, in which oil burning equipment is described and illustrated. Bulletin 52 gives general data pertaining to the equipment. It contains a number of illustrations. A rivet forge, 16 x 21 inches and weighing 180 pounds, is described and illustrated in bulletin 53. Continuous forge furnaces are described in detail in bulletin 54. This bulletin contains a number of excellent illustrations including several line drawings.

GRAPHIC RECORDS.—A circular entitled "Typical Graphic Records," is being distributed by the Esterline Co., Indianapolis, in which curves showing the power consumption of machines are reproduced and explained. The booklet points out the valuable use of records in comparing the amount of power used by various machines, and which results in the detection of faulty practice. A number of records were described in the Oct. 23 issue of THE IRON TRADE REVIEW. The booklet also contains a number of charts which show the power consumed in the operation of furnaces, shears, electric elevators, etc.

FANS.—A unique booklet entitled "A Dance, A Fan and The Girl," has been issued by the Clarage Fan Co., Kalamazoo, Mich. This booklet is a novel departure from the usual trade literature. It contains a story of how an assistant foundry superintendent had to call off an engagement when a fan at the foundry got out of order. Years later the incident is called to his mind when the purchasing agent of the plant of which he is general manager, buys a fan which can be fixed in a fraction of the time it took him to repair the fan years before. The story is interesting and various points of the fans manufactured by the Clarage Co. are brought out in a pleasing way.

FLEXIBLE SHAFTING.—Bulletin No. 104 issued by the Stow Mfg. Co., Inc., Binghampton, N. Y., describes and illustrates flexible shafting. This shafting consists of an inner core constructed of built-up wire coils and a protecting casting with bearings and suitable fittings, for the transmission of power from some source such as an electric motor, countershafting or engine, to the desired toal. The core is brazed or soldered into end fittings, asembled into a reinforced leather or metal casing, which supports the bearings, and is held in the case in such a way that when the shaft is bent no strain will come on the core longitudinally. Various data pertaining to this shafting is given, as well as a number of illustrations showing its use with various tools and in various operation.

Opportunities Abroad

Requests for information should be forwarded to district or co-operative office in your district, of the Bureau of Foreign and Domestic Commerce. Each request should be on a separate sheet and be accompanied by the opportunity number

DISTRICT OFFICES

New York, 734 Customhouse; Boston, 1801 Customhouse; Chicago, 504 Federal bldg.; St. Louis, 402 Third Nat'l Bank; New Orleans, Hibernia Bank; Seattle, Henry bldg.; San Francisco, 307 Customhouse

CO-OPERATIVE OFFICES

Cleveland, Chamber of Commerce; Cincinnati, Chamber of Commerce; Los Angeles, Chamber of Commerce; Philadelphia, Chamber of Commerce; Portland, Oreg. Chamber of Commerce; Dayton, Ohio, Chamber of Commerce; Pittsburgh, Chamber of Commerce

A company in India desires to purchase iron and steel goods, hardware, heavy industrial chemicals, etc. Opportunity No. 30880.

A firm in Spain desires to purchase machinery for mixing, kneading and stamping names on biscuits. Opportunity No. 30924.

A newspaper in France desires to purchase labor-saving machinery, particularly rapid rotary presses, flat-bed presses, punching machines, wire-stitching machines, cutters and folding, mailing, molding, typesetting and autoplate machines, etc. Correspondence should be in French. Opportunity No. 30931.

An engineer in Italy desires to secure an agency for the sale of mechanical and electrical goods. Opportunity No. 30932.

A list of inquiries for American merchandise, such as oil refining machinery, metal goods, chemicals, surgical apparatus, rubber goods, etc., has been received from the American consul at Valencia, Spain. Firms interested in this trade may secure copies of these lists upon application to the bureau or its district offices. Opportunity No. 30944.

A list of inquiries for American merchandise, such as oil refining machinery, metal goods, chemicals, etc., have been received from the American consul at Valencia, Spain. Firms interested in this trade may secure copies of these lists upon application to the bureau. Opportunity No. 30944.

A business man in North Africa desires an agency for the sale of steel products, such as steel bars, galvanized sheet iron, annealed steel wire, etc. Opportunity No. 30949.

A business man in North Africa desires an agency for the sale of steel products, such as steel bars, galvanized sheet iron, annealed steel wire, etc. Opportunity No. 30949.

A Russian civil engineer desires to represent in Latvia American manufacturers of automobiles, typewriters, elevators, engineering supplies, concrete machines, machine tools, etc. Opportunity No. 30964.

The purchase of motors, 3-phase, 40 cycles, 220 volts, controllers, starters, transmission equipment, railroad equipment, centrifugal pumps, steel cables steel balls, office equipment, etc., is desired by a manufacturing company in Belgium. Opportunity No 30966.

A firm in Spain desires to be placed in touch with manufacturers and exporters of metals, timber, chemicals, etc. Opportunity No. 30967.

An American firm is authorized by its main office in China to purchase complete machinery and equipment for the refining of crude camphor. Opportunity No. 30974.

A Frenchman, who has been in this country for some time and is about to return to France, desires to secure an agency for the sale in that country and in Belgium, of textile machinery, etc. Opportunity No. 30978.

Laundry machinery, including washing machines of alternating movement, dryers, pressers, etc., are needed by a firm in France. Correspondence should be in French. Opportunity No. 30980.

A Swiss wholesale merchant of steel and metal products desires to enter into direct business relations with steel works, copper and brass smelting houses, and wire-drawing concerns, as well as firms which can supply dynamo sheet iron, transformer sheet iron and motor sheet iron. Opportunity No. 30983.

An agency is desired by a firm in Spain for the sale of wrought-iron tubes and metallic fittings. Opportunity No. 30984.

A representative of an Australian house importing machinery, now in this country, desires agencies for the sale of windmills, small refrigerating machinery, motor trucks, oil and gasoline engines and lighting plants. Opportunity No. 30985.

A man in Australia desires to be placed in communication with manufacturers of canning machinery. Opportunity No. 30988.

An agency is desired by a man in South Africa for the sale of small suction gas engines, iron piping, barbed wire, iron standards, etc. Opportunity No. 30989.

An agency is desired by a firm in Italy for the sale of heavy motor trucks, motor cranes, agricultural machinery, etc. Correspondence should be in Italian. Opportunity No. 30990.